AUTO TEST
Products Pty Ltd

User Manual
Version 2

Battery System Tester BST-380

User Guide

AUSTRALIAN MADE AND OWNED

Licence ID number: 10242

DECLARATION OF CONFORMITY

We, Auto Test Products Pty Ltd. declare under our sole responsibility that the product Auto*Test* Battery System Tester BST-380 is in conformity with the provisions of the following Council Directive: 1999/5/EC.

A copy of the Declaration of Conformity is available from http://www.autotest.net.au

Chapter 1: Product Summary

1.1 Product Description

The AutoTest BST-380 Battery System Tester uses advanced testing technology to easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starting battery, the health of the battery itself, and common faults in the vehicle starting system and charging system. It can help maintenance personnel to identify problems quickly and accurately, thus leading to efficient vehicle repair.

- Can test all automotive cranking lead acid batteries, including ordinary lead acid, AGM flat plate, AGM spiral, Gel battery, EFB battery and more.
- Directly detect bad cells.
- Polarity reverse connection protection, reverse connection will not damage the tester or affect the vehicle and battery.
- Test batteries for loss of electricity, no need to fully charge before testing.
- Testing standards include a majority of the world's battery standards, CCA, BCI, CA, MCA, JIS, DIN, IEC, EN, SAE and GB.
- Supports multiple languages, the user can select different language packages including: English, Chinese Simple, Chinese Traditional, Japanese, Russian, Spanish, French, Italian, German etc. Other languages can also be customized according to user's requirements.
- Has common additional functions such as a voltmeter, ammeter, thermometer, and standby power for ECU.
- Stores 100 sets of test data for viewing and printing.

1.2 Product Functions

The main functions of the AutoTest BST-380 Battery System Tester include: battery testing, cranking tests, charging tests and some other additional functions.

The battery test is usually used to analyze the battery health status, to calculate the actual cold cranking capability of the battery and the extent of, which provides a reliable analysis of the current condition of the battery. It notifies the user to replace the battery before the battery fails and reaches its useable.

The cranking test is mainly used to test and analyse the starter motor. Through testing the actual required cranking current and cranking voltage of the starter motor, it can find out whether the starter motor is operating correctly. There are several reasons why the starter motor might not operate as required: lubricating system faults causing the starting load torque to increase or rotor friction of the starter motor resulting in increased friction within the unit itself.

Charging tests check and analyze the charging system, including the generator/alternator, rectifier, rectifier diode etc. These tests determine if the output voltage of the generator/alternator is normal, the rectifier diode works correctly and if the charging current is normal.

If one of the above-mentioned parts is not operating normally, it can lead to an over-charge, or incomplete charging of the battery, the battery can be quickly damaged and also greatly shortened its life-span.

Additional product functions include:

View test result, print test result, voltmeter, ammeter, thermometer and temperature compensation, thermometer unit choice, QC mode, client name setting, set language, set date and time format, date and time adjustment, set user info, screen light adjustment, set printer definition and standby power function.

1.3 Technical Parameters

1) Cold Cranking Amps Measurement Range:

Measurement Standard	Measurement Range
CCA	100 - 2000
BCI	100 - 2000
CA	100 - 2000
MCA	100 - 2000
JIS	26A17--245H52
DIN	100 - 1400
IEC	100 - 1400
EN	100 - 1400
SAE	100 - 2000
GB	100 - 1400

2) Voltage Measurement Range: 1.0 to 30VDC.
3) Current Measurement Range: 0 to 900A DC/AC.
4) Temperature Measurement Range: -18°C to +70°C.

1.4 Working Environment

Working Environment Temperature: -20°C to 60°C

These specifications are suitable for automotive manufacturers, automotive maintenance and repair workshops, automotive battery factories, automotive battery distributors, and educational organizations etc.

Chapter 2: Tester Components

The AutoTest BST-380 consists of a battery tester main unit and testing cables. The Current Clamp is an option addition only. The main unit cover is made of acid-resistant plastic.

BATTERY SYSTEM TESTER:
AutoTest Battery System Tester with removeable testing cables.

OPTIONAL ADDITION:
Removeable current clamp meter. Part of the AutoTest Battery System Tester Kit.

Chapter 3: Operation Procedure

3.1 Pre-Test

3.1.1 Connect AutoTest BST-380

- Before running a test, clean the battery poles with wire brush and an alkaline cleaner to avoid any changes in tolerance caused by oil and dust.
- For Group 31 or side-installed batteries, connect and fix the terminal wiring connector otherwise the test result will be inaccurate due to incorrect installation or dirty/bad wiring connectors.
- While testing, ensure that none of the in-vehicle electrical appliances are on, doors are closed, and the ignition key is in OFF position.
- Connect the red test clamp to the +ve battery terminal and the black test clamp to the -ve battery terminal.

CHECK CONNECTION

Ensure the clamps are well connected.

The AutoTest BST-380 requires the two clamps to be well properly with the battery terminal, otherwise, the test will not commence. When you enter the battery test program, the screen will prompt “Check Connection”. Clean the poles and re-connect correctly.

REVERSE CONNECTION

The AutoTest BST-380 has a reverse connection protection function. When clamps are accidentaly connected in reverse, the AutoTest BST-380 will prompt “Reverse Connection” and it will not damage the testing unit or the automotive load.

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

3.1.2 Key Description

Up and Down keys - Select upwards or downwards via the white UP and DOWN keys.
Return key - Return to previous menu via the blue RETURN key.
OK key - Confirm the selection via the green OK key.
MENU key - Enter additional function programs via the MENU key.
Power key
Turn on/off the AutoTest BST-380. (Refer to 3.2 AutoTest BST-380 Startup).

3.1.3 Connect Current Clamp (*OPTIONAL EXTRA*)

To test cranking amps and charging current, first connect the current clamp before startup, then turn on the current clamp power switch.
Only after the AutoTest BST-380 starts up will the current clamp work.
Press the reset key on the current clamp and connect the current clamp jaw around the anode wiring between the battery to be tested and the generator/alternator. See picture.
Ensure that the current clamp jaw is closed completely.

NOTE: (*if you have the current clamp optional addition, part of the AutoTest Battery System Tester Kit.*)

Current clamp jaw must be closed to avoid test accuracy.
Current clamp uses 9V alkaline battery. Turn the clamp power off after using the current clamp.
Before testing the current, take off the current clamp from the battery positive connection cable, and reset.

3.2 AutoTest BST-380 Startup

The AutoTest BST-380 will start up after pressing the power key and display as below in figure 1.

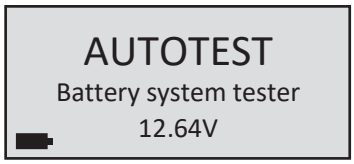
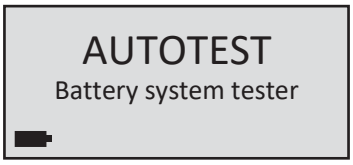


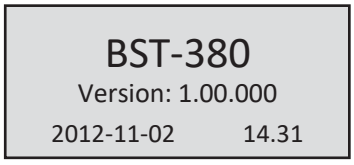
Figure 1, Startup Screen with Voltmeter On

At the bottom left of the startup screen, " " shows the real time level of the internal 9V battery. When the capacity of the 9V battery is not sufficient, replace it to ensure that all the additional functions operate Correctly.
By default, at the middle bottom of the startup screen, it displays the voltmeter value, which can be used as DC voltmeter. The DC voltmeter measurement range is 1.0 to 30VDC. (Caution: Over this measurement range, it may damage the AutoTest BST-380.)



The voltmeter function can be set as "ON/OFF" in the voltmeter under "Additional Functions".
When the voltmeter is ON and no other operations are in progress after startup, the screen will display the startup screen all the time. In this situation, it can be used as a DC Voltmeter. When the OK key is pressed, the AutoTest BST-380 enters the battery test program. If you press the MENU key, it enters the additional function programs.
When the voltmeter is OFF the screen shows the startup screen as below in figure 2. After 2 seconds, it automatically enters the battery test program. Press the MENU key within these 2 seconds and it will enter additional function programs.
Figure 2, above shows the Startup Screen with Voltmeter Off

3.3 Battery Test



After entering the battery test program, the AutoTest BST-380 displays the tester model and version for approx. 2 seconds, see figure 3.
Figure 3, Screen with AutoTest BST-380 model and version
The bottom line of the screen shows the current date and time, this format can be edited and adjusted in the additional functions.
For details, refer to Additional Function 3.8.10 "Set Date and Time" and 3.8.11 "Date and Time Adjustment". The AutoTest BST-380 will display the following instructions in a sequence, select accordingly.

3.3.1 IN-VEHICLE or OUT-OF-VEHICLE

SELECT TEST IN-VEHICLE

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

1) **IN-VEHICLE** means the battery is connected to the vehicle generator/alternator or vehicle electrical appliance.

SURFACE CHARGE DETECTED TURN LIGHTS ON

When a surface charge is detected by the AutoTest BST-380, it prompts "SURFACE CHARGE DETECTED, TURN LIGHTS ON".

Turn lights on as prompted to eliminate the battery surface charge, the AutoTest BST-380 will then display the following messages in a sequence:

TURN LIGHTS OFF	HEADLIGHTS ON

Now that the detection of the surface charge has been eliminated, turn lights off as prompted, then press the OK key. The AutoTest BST-380 will recover automatically.

SELECT TEST OUT- OF-VEHICLE

2) **OUT-OF-VEHICLE** means the battery is not connected with any of the vehicle loaded, i.e. battery connection is cut off.

3.3.2 Select Battery Charge State

After selecting the battery location, the AutoTest BST-380 will prompt to select the battery charge status, i.e. Before Charge or After Charge.

Press the UP/DOWN key to the select battery charge status, then press the OK key to confirm. This process ensures a more accurate test result.

SELECT CHARGE BEFORE CHARGING	SELECT CHARGE AFTER CHARGING

NOTE: Select Before Charge for Cold Vehicle and After Charge for Hot Vehicle.

3.3.3 Select Battery Type

After the battery charge status is selected, the AutoTest BST-380 will prompt to select battery type, i.e. Regular Flooded, AGM Flat Plate or AGM Spiral, Gel battery or EFB battery. Press the UP/DOWN key to select the battery type, and press OK key to confirm.

SELECT TYPE REGULAR FLOODED	SELECT TYPE AGM FLAT PLATE

SELECT TYPE AGM SPIRAL	SELECT TYPE GEL	SELECT TYPE EFB

When it is an IN-VEHICLE test, the battery installation method will also be selected, e.g. TOP, SIDE or REMOTE (This selection is not required for OUT-OF-VEHICLE), then press the OK key to confirm.

REMOTE is adopted for some in vehicle batteries which are too tightly installed to use the test clamps to connect the battery poles.

SELECT TYPE TOP POST	SELECT TYPE SIDE POST	SELECT TYPE REMOTE

NOTE: For REMOTE test, there will be a little tolerance. For any doubt, take off the battery and select “OUT-OF-VEHICLE” to re-test.

3.3.4 Battery System Standard and Rating

The AutoTest BST-380 Battery System Tester will test each battery according to the selected system and rating.

Use the UP/DOWN key to select according to the actual system standard and rating marked on the battery. See the

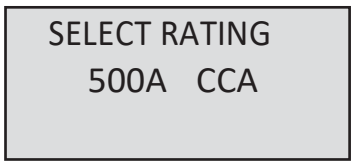
arrow indicating its location in the below picture.

- 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°CJapan 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 National Standard.

SELECT INPUT CCA

The Rating ranges are as follows:

Measurement Standard	Measurement Range
CCA	100 - 2000
BCI	100 - 2000
CA	100 - 2000
MCA	100 - 2000
JIS	26A17--245H52
DIN	100 - 1400
IEC	100 - 1400
EN	100 - 1400
SAE	100 - 2000
GB	100 - 1400



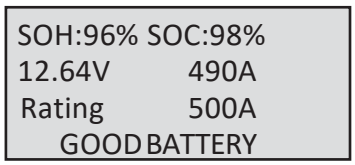
Input correct test standard and rating, press OK key, AutoTest BST-380 starts to test, and the display will prompt with "TESTING". See below.

It takes approx. 3 seconds to display the battery test result.

3.3.5 Battery Test Result

Battery test results include 5 types as follows:

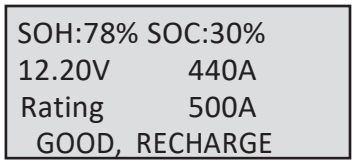
1. Good Battery



The battery is without any problems.

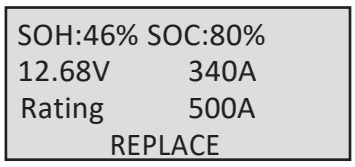
NOTE: SOH means State of Health. SOC means State of Charge.

2. Good, Recharge



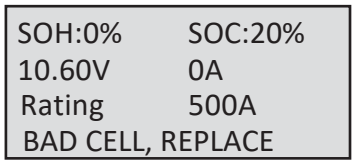
Good battery but low current, recharge before using.

3. Replace



The battery is near to or has already reached the end of usable life, replace battery.

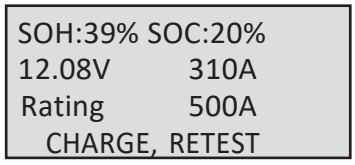
4. Bad Cell, Replace



Battery internally damaged, broken cell or short circuit, replace battery.

5. Charge, Retest

An unstable battery should be recharged and retested to avoid errors. If the same test result appears after a recharge and retest, the battery is considered faulty, replace the battery.



NOTE: If "Replace" resulted from IN -VEHICLE mode, it might be that the vehicle cable is not well connected to the battery. Ensure to reconnect the cable and retest the battery under OUT-OF-VEHICLE mode before deciding to replace it.

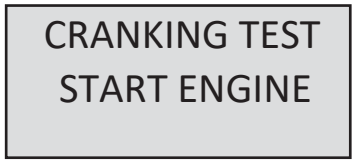
NOTE: After testing, if you need to return, press RETURN key to directly return to the startup screen.

After the battery test:

If it is in "OUT-OF-VEHICLE" test state, press OK key, it will print the test result.

If it is in "IN-VEHICLE" test state, press OK key to bring up the Cranking Test.

3.4 Cranking Test



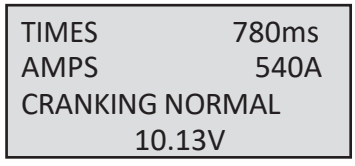
Connect with current clamp in advance (*if you have this optional addition*).

A bad connection will cause the AutoTest BST-380 to not test the actual cranking amps accurately. Refer to 3.1.3 for current clamp connection.

Starting the engine as prompted, the AutoTest BST-380 will automatically complete the cranking test and display the result.

Normally, cranking voltage values lower than 9.6V are regarded as abnormal, higher than 9.6V is OK.

Test result includes actual cranking voltage, actual cranking amps, and actual cranking time.



When the cranking test is abnormal, the battery test results will also be displayed at the same time as per the image below.

TIMES	1020ms
AMPS	320A
CRANKING	LOW
REPLACE	9.12V

After testing is finished, do not shut down the engine, press OK key to enter the Charging Test.

3.5 Charging System and Rectifier Diode Test

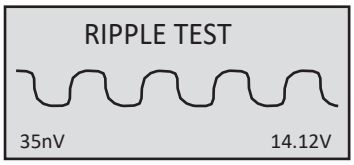
When entering the charging test, the AutoTest BST-380 will prompt "Charging Test?" Press the OK key again to start the charging test.

CHARGING TEST?

NOTE: Do not shut down the engine during the test. All electrical appliances and devices are in the OFF state. Turning on/off any electrical appliance in the vehicle during the test will affect the accuracy of the test result.

The AutoTest BST-380 will do the following tests in a sequence:

For a ripple test, the AutoTest BST-380 will display the real time ripple and shows ripple voltage and charging voltage values at the bottom line.



It takes approx. 6 seconds for the ripple test.
After the ripple test, the AutoTest BST-380 will automatically start the loaded voltage test. Loaded Volt Testing takes approx. 3 seconds, then it hints "Step on accelerator to increase engine rotating speed". See below picture:
Operate accordingly to increase the engine rotating speed to 3000 turns or above and keep for 5 seconds.

LOADED TESTING

INCREASE REV

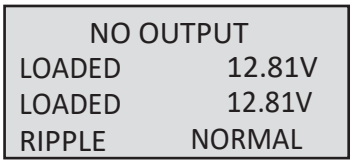
The AutoTest BST-380 will start the charging volt test after an increase in rev's is detected.

TESTING
***

After the test is finished, the AutoTest BST-380 displays the effective charging volts, ripple test result and charging test result.

CHARGING	NORMAL
LOADED	14.18V
LOADED	14.36V
RIPPLE	NORMAL

NOTE: If no increase in rev's is detected, it could be a problem with the generator/alternator, regulator, or connection with battery. The AutoTest BST-380 will try 3 times to further, if it still fails, it will skip the increase in rev's detection and the test result displays "No Volt Output".



Check the connection between generator/alternator and battery, then retest. Charging Test Result:

1. **Charging Volt: Normal**
   Charging system shows the generator output to be normal, no problem detected.

2. **Charging Volt: Low**
   Charging volt of the charging system is low.

   Check drive belt of the generator/alternator for slip. Check the connection between the generator/alternator and the battery is normal. If both the drive belt and the connection are in good condition, follow the manufacturer's suggestions to eliminate generator/alternator faults.

3. **Charging Volt: High Generator/alternator output volt is high.**
   Since most of the vehicle generators/alternators use an internal regulator, the generator/alternator assembly must be replaced. (Some old-style cars use an external regulator, then directly replace the regulator.) The normal high voltage of the voltage regulator is a maximum of 14.7±0.5V. If the charging voltage is too high, it will overcharge the battery and the battery life will be.

4. **No Volt Output:**
   No generator/alternator voltage output is detected. Check the generator/alternator connection cable, the drive belt of the generator/alternator and the engine.

5. **Diode Test:**
   Diodes are tested through the ripple current test, the AutoTest BST-380 will find out whether the diode is normal or not. When ripple voltage is too high, it proves at least one diode is damaged. Check and replace the diode.

Now, all tests have been done.

If client code setting function is off, press the OK key again, it will then prompt "Print Result?", press OK key to print.

If Client Name setting function is on, press OK key again, it will then prompt "Print Result?", press the OK key to input the Client Name. After Client Name input, press the OK key again, it will prompt "Print Result?", press the OK key to print.

3.6 Client Name Input

Client Name in a sequence, 1st to 7th digits are letters or numbers. When pressing UP/ DOWN keys, numbers and letters will be displayed in a scrolling manner, select the number or letter needed, press OK key to confirm and carry on the input for the next digit.

CLIENT CODE AA88888	For example, to input “BA8888”. Press the UP/DOWN key to select the first character “A”, press OK to finish the first digit input.
CLIENT CODE BA88888	Press the UP/DOWN key to select the second letter “B”, press OK to finish the second digit input.
CLIENT CODE BB88888	Continue until the 7th digit input is finished. Press the OK key again, the AutoTest BST-380 will print out the test result including the plate number.
CLIENT CODE BB4F50N	

NOTE: For languages other than Chinese, the Client Name input method is the same (first digit changed to number or letter).

3.7 24V System Test

24V BATTERY	An ordinary 24V battery group combines two 12V batteries in a series connection. Therefore, when testing a 24V battery, the AutoTest BST-380 will prompt “24V Battery”, divide the batteries and test one by one. It’s not necessary to break off the connection cable (Comparatively, the parallel connected battery group must cut off the cathode connection), the test method is the same as testing a single 12V battery.

For 24V charging and cranking tests, connect the red clamp to the anode of the 24V battery group and the black clamp to the cathode of the 24V battery group.

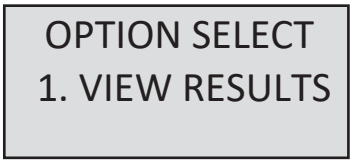
NOTE: It’s not he anode and cathode of the single battery but the battery group), select IN-VEHICLE, screen displays “24V Battery”, ignore the prompt, after 3 seconds, the AutoTest BST-380 will skip the battery test program and enter the cranking test. Follow the method of a 12V system test to complete the 24V charging and cranking tests. The test process is same as with a12V system.

3.8 Additional Functions

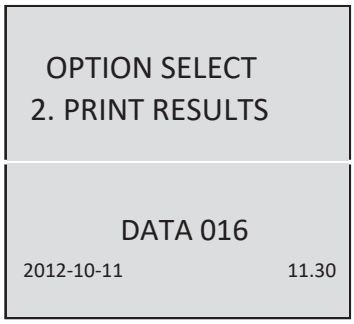
Press MENU key to enter Additional Function (See 3.2 AutoTest BST-380 Startup). Following options and operation can be done.

3.8.1 View Results

View results from the last test by pressing OK key.



3.8.2 Print Results



The AutoTest BST-380 can view the latest 100 offsets of test data and print out any set for reference via the thermal printer. Press OK key to enter.

Search the test results by date and time, then press the OK key.

NOTE: When internal memory is full, the AutoTest BST-380 will automatically clear the earliest test results. Alternatively select “Memory Reset” under “QC Mode” in Additional Functions to clear all data in memory and store data all over again.

NOTE: Once reset, all data will be cleared and cannot be recovered.

3.8.3 Voltmeter

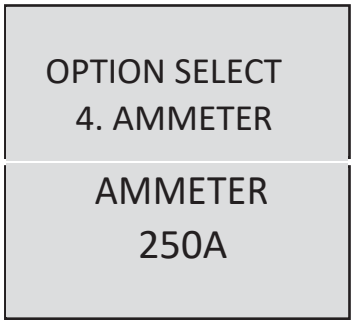
The AutoTest BST-380 Battery System Tester can also be used as DC voltmeter. The working range is 1.0-30V DC.

CAUTION: The AutoTest BST-380 unit can be damaged when connected to voltages above 30V!

This function can set the voltmeter On/Off at the bottom line of the startup screen. After successful setup, it shows “OK” for 2 seconds, then returns to the previous screen.

3.8.4 Ammeter

The AutoTest BST-380 can be used as an ordinary ammeter via the attached current clamp. Press OK key to display the ammeter screen.

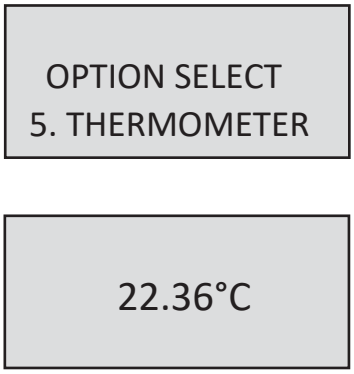


CAUTION: (*if you have the current clamp optional addition*)

1. Turn the current clamp power off as soon as the ammeter test is done, otherwise it will shorten the life of the internal battery.
2. Before each test, take off the current clamp from the anode and reset.

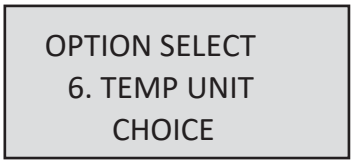
3.8.5 Thermometer

The AutoTest BST-380 has an integrated internally temp sensor, which detects the ambient environment temperature.



Press the OK key to display the thermometer screen.

3.8.6 Thermometer Unit Choice



This option is to set Fahrenheit or Celsius.

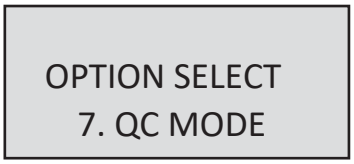
First, press the OK key one time, then use the UP/DOWN arrow to choose °C or °F. After successful setup, it displays "OK" for 2 seconds, then will return to the previous screen.

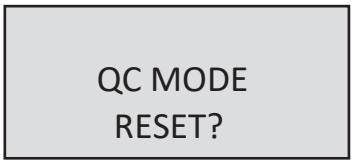
3.8.7 QC Mode

In QC mode the AutoTest BST-380 will simplify the test input process, which makes the battery test much faster and easier. The AutoTest BST-380 will count the test for the purpose of analyzing and tracking battery quality.

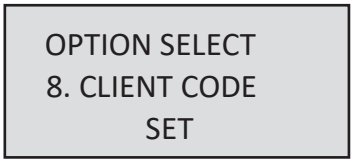
This function is applicable for vehicle manufacturers and maintenance workshops to test and analyze the a purchased battery, and also for battery factory's to inspect and analyze outgoing batteries. QC function is off by default.

After successful setup, the unit will display "OK" for 2 seconds, then return to the previous screen. In addition, memory reset in QC mode will clean all stored data, including the 100 sets of data viewed in "Print Results". Once reset, data cannot be recovered.





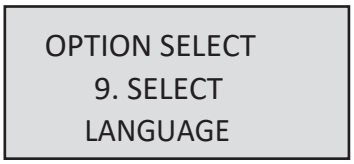
3.8.8 Client Name Input Function



This option is to set the Client Name input function ON or OFF.

After successful setup, it displays "OK" for 2 seconds, then returns to the previous screen.

3.8.9 Set Language

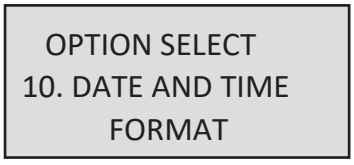


This option is to select the user language.

The system contains a multi-language package, including English, Russian, Japanese, Spanish, German, French, Italian, etc.

After successful setup, it shows "OK" for 2 seconds, then returns to the previous screen.

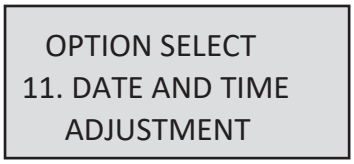
3.8.10 Set Date and Time Format



This option is to set the date and time format, and time display in 12-hour or 24-hour. Default format is MM/DD/YY, 12-hour.

After successful setup, it shows "OK" for 2 seconds, then return to the previous screen.

3.8.11 Date and Time Adjustment



This option is to adjust and check the system date and time.

Adjustment is in the sequence of Year, Month, Date, Hour, Minute. This adjustment sequence does not affect the date and time format.

1. Press the UP/DOWN key to modify the last two digits of the year. Press confirm key to enter the month adjustment.
2. Press the UP/DOWN key to modify the month. Press confirm key to enter the date adjustment.
3. Press the UP/DOWN key to modify the date. Press confirm key to enter the hour adjustment.

4. Press the UP/DOWN key to modify the hour. Press confirm key to enter the minute adjustment.
5. Press the UP/DOWN key to modify the minute. Press confirm key until OK is displayed.
6. After adjustment, the AutoTest BST-380 will return to the startup screen.
7. During time adjustment, the time number will flash, long press the key to increase or reduce the number.

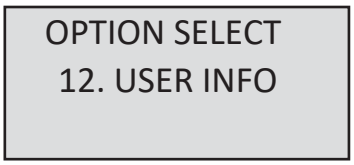
NOTE: During time adjustment, pressing the UP, DOWN or CONFIRM key must be over 1 second to avoid accidental entry. To modify the number, a long press of the UP/ DOWN key, the the number will automatically and continuously increase or decrease.

NOTE: In date and time setting, the return key is not used to store the system time.

Once the date time has been entered as "YMDHM" has been done, press the OK key 5 times to return.

3.8.12 Set User Information

This option is to set information for the users Information, telephone, address, website, etc. It supports only English



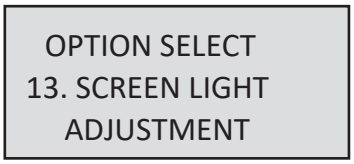
letters and number input. A maximum of 8 lines are allowed and each line has 21 characters available for input.

If you choose to enter a character, input it in another new line. For each character setting, it is a space by default.

If you end the input halfway across a line, continuously press the OK key 4 times to complete the setting. After successful setup, it displays "OK" for 2 seconds, then returns to the previous screen. If you need to reinput the user information, press the OK key to open the information inputted previously, long press the MENU key to delete old information and re-input.

3.8.13 Screen Back Light Adjustment

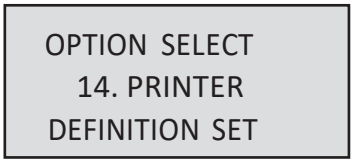
This function is to adjust the screen backlight brightness for power saving mode and for a clear view of the displayed characters under sunlight.



The brightness range is adjustable from 1 to 4. Default brightness value is 2. Press the UP/DOWN key to set. After successful setup, it displays "OK" for 2 seconds, then returns to the previous screen.

3.8.14 Set Printer Definition

This function is to adjust the clarity of the printed characters to ensure a good printing effect under various environments and conditions.



The definition range is adjustable from 1 to 9. The default clarity value is 4. Press the UP/DOWN key to set. After successful setup, it displays "OK" for 2 seconds, then returns to the previous screen.
NOTE: The printer definition is inversely proportional to the printing speed. Also, higher definition printing requires more power.

3.8.15 Standby Power Function

OPTION SELECT 15. STANDBY POWER

This function is to set standby power, which is OFF by default.

For some luxury vehicles, the ECU must be powered on. Once powered off, the ECU will be automatically locked. The standby power function offers ECU power for a short time when the vehicle battery needs to be replaced to avoid automatic lock. When standby power function is ON, the AutoTest BST-380 will use the internal 9V battery to supply power after the clamps are connected “Red to Anode & Black to Cathode” with the battery connection cable.

CAUTION: When the standby power function is ON, do not touch the Red & Black clamps to each other to avoid a short circuit. After using, press the Return key, the AutoTest BST-380 will automatically turn off the standby power.

NOTE: The 9V battery, due to its small capacity, can only supply power for short time. Before using the AutoTest BST-380 as standby power, make sure the internal 9V battery has sufficient capacity, and try to complete the battery replacement within a short time to avoid any automatic lock caused by power off.

Chapter 4: Daily Maintenance

4.1 Eliminate Common Faults

4.1.1 Screen Not Lit

Check whether the Power is turned on.

Check the connection with the battery and if it is well connected.

Battery voltage is probably too low to drive the AutoTest BST-380 (lower than 1.0V). Fully charge the battery and retest. The internal 9V battery may need to be replaced. Replace the 9V battery and retest.

4.1.2 Printer Common Faults

Printer Paper Jam: Paper not properly installed, causing paper skew. Open the paper box and reload the paper.

Paper Not Moving: Paper used up. Replace the print paper.

Low Definition: Set printer definition under Additional Functions (refer to 3.8.14).

4.2 Replace Internal Battery

The AutoTest BST-380 Battery System Tester uses one 9V battery (alkaline battery recommended) to test the battery with low voltage at 1V and to perform the additional functions. When testing the battery, the screen shows if the internal battery capacity is not sufficient. When the 9V battery is not working, the AutoTest BST-380 can still test the battery with a low voltage at 5.5V. Steps for replacing battery are as follows:

Step 1 use a screwdriver to loosen the battery box cover screw and take off the cover.

Step 2 Insert a 9V battery. There are anode and cathode marks in the battery box and also, a fixing tip. A reverse placed battery cannot be laid flat. Do not force the battery down, otherwise the battery box tip will be damaged.

Step 3 Cover the battery box and fix the screw.

Chapter 5: Warranty Clause

To ensure prompt warranty service should it be required, please complete warranty registration form, and return to AutoTest Products Pty Ltd within 10 days of purchase of the product. AutoTest Products or an Authorised Service Centre warrants this product against defects in material and workmanship for a period of 12 months from the original date of purchase. This warranty applies only to products and components supplied by AutoTest Products which can be identified by the trade name or logo affixed to them or by other documents. AutoTest Products does not warrant any products not supplied by AutoTest Products. During the warranty period, AutoTest Products or an Authorised Service Centre will repair (or at its option replace), any defective component(s) without charge for labour, provided the product is returned in its original or suitable equivalent container, freight prepaid, to an authorised AutoTest Service Centre. Transit insurance and return freight will be at the owner's expense.

In order to obtain calibration, warranty or non-warranty service, ship the product, freight and insurance prepaid to your nearest AutoTest Service Centre. Attach to the product your name, address, contact numbers, description of the problem and if a warranty claim, proof of purchase (dated sales receipt or invoice).

AutoTest Products or an Authorised AutoTest Service Centre reserves the right to refuse warranty repair if accident, abuse, misuse or misapplication has damaged the product in transit or as a result of service or modifications by other than an Authorised Service Centre, nor are any other warranties expressed or implied, including any regarding merchantability or fitness for any other particular purpose. AutoTest Products or an Authorised Service Centre is not responsible for incidental or consequential damages resulting from the breach of any express or implied warranty, including damage to property and, to the extent permitted by law, damages for personal injury.

NOTES:

AUTO *TEST* Products Pty Ltd

69 Parsons St Kensington VIC 3031 Australia
Phone: (+61 3) 8840 3000
Service: (+61 3) 8840 3016 service@autotest.net.au
Sales:(+61 3) 8840 3017 sales@autotest.net.au

www.autotest.net.au