



# 6/12V HANDHELD BATTERY TESTER

MODEL NO: **BT91/10.V3**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions, and properly maintained, give you years of trouble free performance.

**IMPORTANT:** PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.



Refer to instructions



Wear eye protection



Wear protective gloves



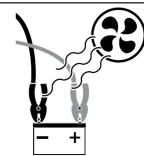
Wear protective clothing



Warning corrosive substance



Warning: explosive material



Use in well ventilated areas



No open flames

## 1. SAFETY

- ▲ **DANGER!** Be aware, lead acid batteries generate explosive gases during normal battery operation, for this reason, it is very important to read and follow these instructions carefully each time you use the battery tester. Follow these instructions in conjunction with those of the battery and vehicle manufacturer, and the maker of any equipment you intend to use in the vicinity of the battery. Remember to review warning marks on all products and on engines.
- **WARNING!** Modern vehicles contain extensive electronic systems. You are required to check with the vehicle Manufacturer, for any specific instructions regarding the use of this type of equipment on each vehicle. No liability will be accepted for damage / injury, where this product is not used in accordance with all instructions.
- 1.1. **PERSONAL PRECAUTIONS**
  - ✓ Ensure there is another person within range of your voice and close enough to come to your aid, should a problem arise when working near a lead-acid battery.
  - ✓ Wear safety eye protection and protective clothing. Avoid touching eyes while working near battery.
  - ✓ Have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
  - ✓ Wash immediately with soap and water if battery acid contacts skin or clothing. If acid enters eye, flush eye immediately with cool, clean running water for at least 15 minutes and seek immediate medical attention.
  - ✓ Remove personal metallic items such as rings, bracelets, necklaces and watches. A lead-acid battery can produce a short-circuit current which is high enough to weld a ring or the like to metal, which would cause severe burns.
  - ✓ Ensure hands, clothing (especially belts) are clear of fan blades and other moving or hot parts of engine, remove ties and contain long hair.
  - × **DO NOT** smoke or allow a spark or flame in the vicinity of battery or engine.
- 1.2. **GENERAL SAFETY**
  - × **DO NOT** operate the load test switch for more than 10 seconds at a time. (Failure to release the switch after 10 seconds may result in the switch burning out and invalidating your warranty.)
  - ✓ Familiarise yourself with the application and limitations of the tester as well as the potential hazards. Also refer to the vehicle manufacturer's hand book.
  - ✓ Ensure the tester is in good order and condition before use. If in any doubt **DO NOT** use the unit and contact an electrician.
  - ✓ Only use recommended attachments and parts. To use unapproved items may be dangerous and will invalidate your warranty.
  - ✓ Ensure the tester load switch is 'Off' before attaching/detaching the power clamps to/from the battery terminals.
  - ✓ Keep tools and other items away from the engine and ensure you can see the battery and working parts of engine clearly.
  - ✓ Confirm that the battery to be tested is either 6 or 12 volt before attaching clamps to battery terminals.
  - ✓ Should the unit suffer excessive shock, it must be checked by a qualified service agent before further use.
  - × **DO NOT** dismantle the tester for any reason. The tester must only be checked by qualified service personnel.
  - ✓ If the battery terminals are corroded or dirty clean them with a solution of water and baking soda before attaching the clamps.
  - ✓ Keep children and unauthorised persons away from the working area.
  - **WARNING!** To prevent the risk of sparking, short circuit and possible explosion **DO NOT** drop metal tools in the battery area, or allow them to touch the battery terminals.
  - × **DO NOT** cross connect leads from tester to battery. Ensure positive (+/RED) is to positive and negative (-/BLACK) is to negative. If symbols cannot be distinguished, remember that the negative terminal is the one directly connected to the vehicle bodywork.
  - × **DO NOT** pull the cables or clamps from the battery terminals.
  - × **DO NOT** use the tester outdoors, or in damp, or wet locations and **DO NOT** use within the vicinity of flammable liquids or gases.
  - ✓ Ensure there is effective ventilation to prevent a build-up of explosive gases, and **DO NOT** cover or obstruct tester ventilation louvres.
  - × **DO NOT** use the tester for a task for which it is not designed.
  - ✓ When not in use, store the tester carefully in a safe, dry, childproof location.

## 2. INTRODUCTION

Tests 6 and 12V batteries. Applies load across terminals and reads voltage performance. Also checks charging voltage. Fitted with moving-coil meter. Features a pistol grip handle for ease of use.

## 3. OPERATION

- **WARNING!** Ensure you read, understand and apply the safety and operational instructions before connecting the tester clamps to the battery. Only when you are sure that you understand the procedures is it safe to proceed with the testing process.

### 3.1. PREPARATION

- 3.1.1. Check battery casing for cracks or leakage and confirm whether **6 volts** or **12 volts**.
- 3.1.2. Clean battery terminals.
- 3.1.3. If practical, check electrolyte levels and top up with distilled water as required.

### 3.2. CONNECTION

- **WARNING!** Ensure the vehicle or battery is in a well ventilated area before starting to test.
- 3.2.1. Attach the positive red clamp to the positive (+) battery terminal. Attach the negative black clamp to the negative (-) battery terminal. Use the extended clamps if necessary. To ensure good electrical contact twist the clamps on the terminals two or three times. Correct connection indication will sweep the pointer clockwise across the voltage scale; if connected incorrectly the pointer will sweep anti clockwise. If there is no movement from the pointer, it is either a bad connection or a dead battery.
- 3.2.2. Ensure that the clamp cables are clear of hot or moving engine parts, especially if a starter or charging test is required. Ventilation slots in the tester casing should not be obstructed and the meter scale easily visible with access to the load switch.

### 3.3. BATTERY LOAD TEST

**NOTE!** On the first load test, smoke may be emitted from the louvres in the tester casing, this is normal and temporary.

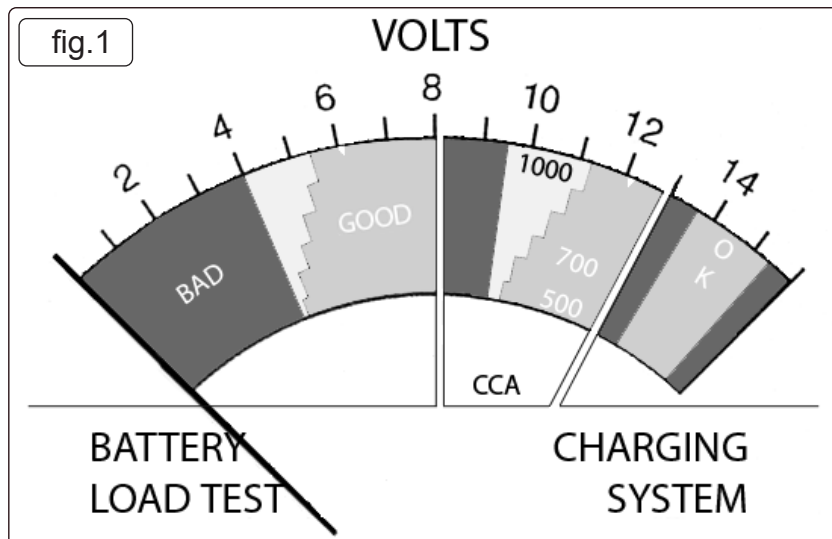
- 3.3.1. Press the load switch (red rocker switch on the face of the unit beneath the display) and hold until meter reading stabilises, or for a maximum of 10 seconds. (Failure to release the switch after 10 seconds may result in the switch burning out and your warranty being invalidated.) Note the meter reading and then release the load switch.

- 3.3.2. Compare the meter reading with load test chart (3.4) to determine battery condition.

- NOTES:**
- a) For **12 volt** batteries the green sector (fig.1) border is marked with nominal cranking current from 500 to 1000 amps and stepped in 100 amp intervals. Record this figure and compare with battery manufacturer's quoted figure to give an indication of any deterioration.
  - b) Battery performance falls at low temperatures and quoted cranking amps should be reduced by 50 amps at 20°F(-7°C) and 100 amps at 0°F(-18°C).

### 3.4. LOAD TEST CHART

Load Test Result	Battery Condition
OK-Green <b>12 Volts</b> (fig.1 - 10V Green to 13V Green CCA) <b>6 Volts</b> (fig.1 - 4V Green to 8V Green)	Battery capacity is good. May or may not be fully charged. Check electrolyte specific gravity to determine charge state. If not fully charged, check for charging system fault (section 3.6) or electrical drain.
Weak or Bad -yellow or red, but pointer reading steady. <b>12 Volts</b> (fig.1 - 8V to 11.4V CCA) <b>6 Volts</b> (fig.1 - 0V to 5.5V)	Battery capacity is unsatisfactory. Battery may be either:- (1) defective or (2) partly discharged. Check electrolyte specific gravity. If over 1.225, the battery is defective. If under 1.225, recharge the battery and retest. If cell to cell specific gravity varies by more than 0.025 a cell defect may exist. If charging does not bring specific gravity to full charge level, the battery is either sulphated or has lost active material.
Weak or Bad - yellow or red, but pointer reading falling after 10 seconds on load.	Battery may be defective. Release load switch and note the meter reaction. If the voltage recovers to 12 volts (6 volts for a 6 volt battery) or more in a few seconds, then the battery is probably defective. If the voltage recovers slowly the battery may only be discharged. Check the electrolyte specific gravity and proceed as above



Open Circuit Voltage 12 volt/6 volt battery	Charge %
11.7/5.8 or lower	0
12.0/6.0	25
12.2/6.1	50
12.4/6.2	75
12.6/6.3 or higher	100

### 3.5. BATTERY VOLTAGE/CHARGE LEVEL

- 3.5.1. If the load test result indicates a battery fault allow battery to stabilise for a few minutes and then read the open circuit voltage - meter reading with load switch 'Off'.
- 3.5.2. Compare the reading with the Voltage/Charge table above right to get an estimation of the charge level.
- 3.5.3. The battery is considered charged at 75% or more. If it failed the load test with this charge it should be replaced. If the voltage indicates a charge level below 75% then charge the battery and load test again. If battery fails this second test replace it.

### 3.6. CHARGING SYSTEM (12 VOLT)

- 3.6.1. Start engine and allow to reach normal operating temperature. Switch off all accessories.
- 3.6.2. Run engine at 1200 to 1500rpm and note meter reading, which should be in the green 'OK' sector (fig.1). **DO NOT press the load switch.**
- 3.6.3. Switch on headlights and heater fan (highest speed), meter reading should remain in the green 'OK' sector.
- 3.6.4. A reading in the red sector to the left (fig.1) indicates a fault in the charging system which will cause the battery to be under charged. A reading in the red sector to the right (fig.1) indicates a fault which will cause the battery to be over charged.

**NOTE:** Although not marked on the meter scale the 'OK' range for a **6 volt** charging system is **6.8 to 7.5 volts**.

### 3.7. STARTER MOTOR (12 VOLT)

**NOTE:** This test requires that the battery is in good condition and is charged to at least 75% capacity.

3.7.1. Disable ignition system (remove fuse or similar) so that engine will not start.

3.7.2. Carry out a load test (section 3.3.), if not already done, and note voltage reading.

3.7.3. Use the table given below to determine the equivalent minimum cranking voltage. Note that for engines of less than 3.25 litres take the next higher figure. For example:

a) 3.5 litre engine - load test result 11.0 volts, gives min. cranking voltage of 9.7 volts.

b) 1.5 litre engine - load test result 11.0 volts, gives min. cranking voltage of 10.2 volts

Load voltage	10.2	10.4	10.6	10.8	11.0	11.2	11.4
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Min. cranking voltage	7.7	8.2	8.7	9.2	9.7	10.2	10.6
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3.7.4. Operate the starter motor and note the voltage during cranking.

3.7.5. A reading below the minimum cranking voltage indicates that the starter motor is taking excessive current. This may be due to poor connections, to a faulty motor or to the battery being too small for vehicle.

3.7.6. After test reinstate ignition system.

**NOTE:** For a **6 volt** system test as above and note load test voltage. Double this value and determine equivalent min. cranking voltage as in 3.7.3. Halve the figure to give minimum cranking voltage for the **6 volt** system and then proceed from 3.7.4.



#### ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.



#### WEEE REGULATIONS

Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). When the product is no longer required, it must be disposed of in an environmentally protective way. Contact your local solid waste authority for recycling information.

**Note:** It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice. Please note that other versions of this product are available. If you require documentation for alternative versions, please email or call our technical team on [technical@sealey.co.uk](mailto:technical@sealey.co.uk) or 01284 757505.

**Important:** No Liability is accepted for incorrect use of this product.

**Warranty:** Guarantee is 12 months from purchase date, proof of which is required for any claim.

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