

INSTRUCTIONS FOR: BATTERY TESTERS MODELS: BT91/1 & BT91/2

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. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY INSTRUCTIONS



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 and those published by the battery and vehicle manufacturers, 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.

1.1. PERSONAL PRECAUTIONS

- ✓ Ensure that there is another person within hearing range 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 such items to the vehicle, and cause severe burns.
- ✓ Ensure that 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 the battery or engine.



1.2. GENERAL SAFETY INSTRUCTIONS

- ✓ Familiarise yourself with the application, limitations and potential hazards of the tester. Also refer to the vehicle manufacturer's hand book. *IF IN ANY DOUBT CONSULT A QUALIFIED ELECTRICIAN.*
- ✓ Ensure that the tester is in good condition before use. If in any doubt do not use the unit and contact a qualified electrician.
- ✓ Only use recommended attachments and parts. To use unapproved items may be dangerous and will invalidate your warranty.
- ✓ Keep tools and other items away from the engine and ensure that you can see the battery and working parts of engine clearly.
- ✓ Confirm that the battery to be tested is 6 or 12 volt, and not 24 volt, before using the tester.
- ✓ If the tester receives a sharp knock or blow the unit must be checked by a qualified service agent before using.
- ✓ If the battery terminals are corroded or dirty clean them before using the tester.
- ✓ Keep children and unauthorised persons away from the work area.
- ✗ **DO NOT** dis-assemble the tester for any reason. The tester must only be checked by qualified service personnel.
- ☐ **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 BT91/2 tester to battery. Ensure positive (RED) lead is to positive terminal and negative probe is to negative terminal. If battery symbols cannot be distinguished, remember that the negative terminal is the one directly connected to the vehicle bodywork.
- ✗ **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.
- ✗ **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

The BT91/1 tests 6 and 12V lead-acid batteries under load.
The BT91/2 tests 6 and 12V lead-acid batteries under load and can also be used as a normal volt meter to check the condition of starting and charging systems.

3. OPERATION

- ☐ **WARNING!** Ensure that you read, understand and apply the safety and operational instructions before apply the tester probes to the battery. Only when you are sure that you understand the procedures is it safe to proceed with the testing process.
- ☐ **WARNING!** During and after load testing the load resistor (see fig. 1.B) will be very hot. Do not touch or place on vulnerable surfaces.

NOTE: ON THE FIRST LOAD TEST SMOKE MAY BE EMITTED FROM THE COIL ON THE TESTER. THIS IS OIL BURNING OFF AND IS NORMAL.

3.1. Preparation

- ☐ **WARNING!** Ensure that the vehicle, or battery, is in a well ventilated area before starting to test.
- 3.1.1. Check battery casing for cracks or leakage and confirm that it is 6 or 12 volts.
- 3.1.2. Clean battery terminals.
- 3.1.3. If possible, check electrolyte levels and top-up with distilled water as necessary.
- 3.1.4. Unless otherwise specified tests are carried out with all electrical items switched off.

3.2. BT91/1

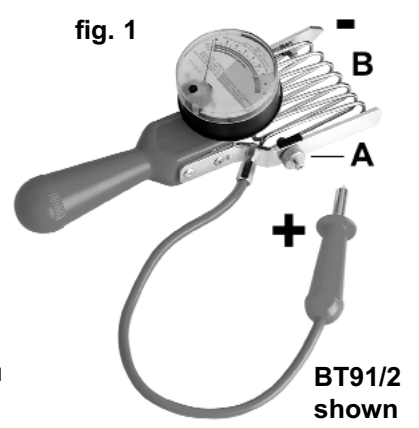
- 3.2.1. Press one probe to the positive (+) battery terminal and the other probe to negative (-) terminal. Note that this tester is not polarity sensitive. If the pointer does not move, either there is a bad connection or the battery is completely dead.
- 3.2.2. Note the meter reading - compare the meter reading with load test chart (3.4) to determine battery condition. **DO NOT test for more than 5 seconds.**

Note: For 12 volt batteries there are two meter scales - the upper for batteries with capacity greater than 40Ah and the lower for those with capacity less than 40Ah.

3.3. BT91/2

For all the following tests, connect the tester to the battery as follows:
Press the positive (+, see fig. 1) lead probe onto the positive battery terminal and negative probe (-, see fig. 1) onto the negative terminal.
If the pointer does not move either there is a bad connection or the battery is completely dead.
Ensure that the cable is clear of hot or moving engine parts, particularly if a starter or charging test is to be carried out.

- 3.3.1. No-load battery voltage
Unscrew the knurled knob (fig. 1.A) to isolate the load resistor (fig. 1.B) and then connect the tester to the battery as described above (engine switched off).



The meter reading, for a healthy battery, should be between 11.5 and 12.5 volts for a 12 volt battery or between 5.5 and 6.5 volts for a 6 volt battery.

- 3.3.2. Battery voltage under load
Screw in the knurled knob (fig. 1.A) to connect the load resistor (fig. 1.B) and then connect the tester to the battery as described above (engine switched off). **DO NOT test for more than 5 seconds.**
Compare the meter reading with load test chart (3.4) to determine battery condition.

Note: For 12 volt batteries there are two meter scales - the upper for batteries with capacity greater than 40Ah and the lower for those with capacity less than 40Ah.

3.4. Load test chart

Load Test Result	Battery Condition
OK - 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 (para. 3.6) or electrical drain.
Bad or Weak - red, but reading steady.	Battery capacity is unsatisfactory. Battery may be either: (1) defective or (2) partly discharged. Check electrolyte specific gravity. If over 1.225 battery is defective. If under 1.225 recharge 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 battery is either sulphated or has lost active material.
Bad or Weak - red, but reading falling after 5 secs. load test.	Battery may be defective. Check no-load voltage. If voltage recovers to 12 volts (6 volts for 6 volt battery) or more in a few seconds then battery is probably defective. If voltage recovers slowly battery may only be discharged. Check electrolyte specific gravity and proceed as above.

3.5. Battery voltage/charge level

- 3.5.1. If the load test result indicates a battery fault, allow battery to stabilize for a few minutes and then read the open circuit voltage i.e. meter reading with knurled knob (fig. 1.A) unscrewed.
3.5.2. Compare the reading with the Voltage/Charge table below to get an estimation of the charge level.

Open Circuit Voltage 12V/6V 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

- 3.5.3. 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 it fails this second test replace it.

3.6. Charging system

- 3.6.1. Start engine and allow to reach normal operating temperature.
3.6.2. **Unscrew the knurled knob (fig. 1.A) to isolated the load resistor.**
3.6.3. Run engine at 1200 to 1500rpm and note the meter reading, which should be in the green sector within the yellow area.
3.6.4. Switch on head lights and heater fan (highest speed), meter reading should remain in the green sector.
3.6.5. A reading in the red sector to the left 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 indicates a fault which will cause the battery to be over-charged.


3.7. Starter motor

- 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 the engine will not start.
3.7.2. Carry out a load test (para. 3.3.), if not already done, and note voltage reading.
3.7.3. **Unscrew the knurled knob (fig. 1.A) to isolated the load resistor.**
3.7.4. Operate the starter motor and note the voltage during cranking.
3.7.5. A drop of more than 3 volts (1.5 volts for a 6 volt system) indicates that the starter motor is taking excessive current. This may be due to poor connections, a faulty motor or the battery being too small for vehicle.
3.7.6. After test reinstate ignition system.

4. DECLARATION OF CONFORMITY

<p>Declaration of Conformity We, the sole UK importer, declare that the products listed below are in conformity with the following standards and directives.</p>	
<p>6V & 12V Battery Testers Models: BT91/1 & BT91/2</p> <p>89/336/EEC EMC Directive</p>	<p> The construction files for these products are held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.</p> <p>Signed by Mark Sweetman  14th February 2003</p> <p><i>For Jack Sealey Ltd. Sole UK importer of Sealey Power Products.</i></p>

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.
IMPORTANT: No liability is accepted for incorrect use of this equipment.
WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.
INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

	<p>Sole U.K. Distributor, Sealey Group, Bury St. Edmunds, Suffolk.</p>
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