

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 there is another person within hearing 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 INSTRUCTIONS

- ✓ 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. *IF IN ANY DOUBT CONSULT AN ELECTRICIAN.*
- ✓ 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 non-recommended 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 12 volt **and not 6 or 24 volt** before attaching clamps to battery terminals.
- ✓ 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 attaching the clamps.
- ✓ Keep children and unauthorised persons away from the working 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 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 & SPECIFICATION

The BT91/11 has a steel case with heavy-duty copper cable and clamps. Dual, large sized, moving coil meters are reliable and easy to read. Suitable for testing 12Volt batteries, alternators, regulators and starters.

VOLTAGE RANGE: 0 - 16V (12V Batteries)

CAPACITY RANGE: 0 - 160Ah, 0 - 1000CCA, 0 - 500A

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.
- **WARNING!** Variable load carbon pile battery testers produce heat when in use. Take care to allow sufficient time to cool down between tests to avoid injury due to heat build up.
- **WARNING!** Ensure that the rotary load control is in the OFF position before attaching or removing clamps to prevent arcing or potential explosion from battery gases. Wear eye protection and gloves during the testing process.

3.1. PREPARATION.

- 3.1.1. Check battery casing for cracks or leakage and confirm that it is 12 volts.
- 3.1.2. Clean battery terminals.
- 3.1.3. If possible, check electrolyte levels and top up with distilled water as necessary.

3.2. BATTERY LOAD TEST.

- **WARNING!** Ensure vehicle, or battery, is in a well ventilated area before starting to test.

NOTE: On the first load test smoke may be emitted from the louvres in the tester casing. This is oil burning off the load bank and is normal.

- 3.2.1. Use the tester horizontally. (i.e. lay it on its back.)
- 3.2.2. **Ensure that the load is OFF by rotating the load control fully anticlockwise.**
- 3.2.3. Attach positive (red) clamp to positive (+) battery terminal and negative (black) clamp to negative (-) terminal. Slightly twist clamps on terminals two or three times to ensure a good electrical contact and a firm grip.
- 3.2.4. Ensure that the clamp cables are clear of hot or moving engine parts, particularly if a starter or charging test is to be carried out. Ventilation slots in tester casing should be unobstructed, meters should be easily visible and load control accessible.
- 3.2.5. Check the battery charge condition by referring to the centre scale on the volt meter. If the indicator needle is in the green area it is safe to proceed with the load test. If the indicator needle is in the red area the battery should be charged before performing the load test.



- 3.2.6 Before applying a load to the battery ensure that you know the amp.hour (Ah) capacity of the battery or the cold cranking amps (CCA) rating.
- 3.2.7 To apply a test load, quickly rotate the load control clockwise until the ammeter registers a value that is 3 times the amp/hour capacity of the battery (see green scale on left hand meter) or 1/2 the cold cranking amp rating (see blue scale).
- 3.2.8 Hold the load for about fifteen seconds.
- 3.2.9 When the buzzer in the unit sounds, observe the voltmeter reading then turn off the load.
- 3.2.10 Compare the meter reading with load test chart below to determine battery condition.

3.3. 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 10 secs. on load.	Battery may be defective. Turn off load and note meter reaction. If voltage recovers to 12 volts 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.

Notes: a) You should also observe the cold cranking amp rating from the blue scale on the left hand meter and compare this 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).
 A Battery Load Test Temperature Compensation chart is provided both on the unit and in these instructions to indicate the change in battery performance at different temperatures.

3.4. Battery voltage/charge level

- 3.4.1. If the load test result indicates a battery fault allow battery to stabilise for a few minutes and then re-read the open circuit voltage - meter reading with load turned 'Off'.
- 3.4.2. Compare the reading with the Voltage/Charge table below to get an estimation of the charge level.

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

- 3.4.3. The battery is considered charged at 75% or more. If it failed the load test with this charge it should be replaced.

3.5. Charging system (12 volt)

- 3.5.1. Connect the tester as in 3.2 and ensure that the load control is OFF.
- 3.5.2. Start engine and allow to reach normal operating temperature. Switch off all accessories.
- 3.5.3. Run engine at 1200 to 1500rpm and note voltage reading, which should be in the green 'OK' sector of the inner scale on the right hand meter.
- 3.5.4. Switch on head lights and heater fan (highest speed), meter reading should remain in the green 'OK' sector.
- 3.5.5. 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.

3.6. Starter motor (12 volt)

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

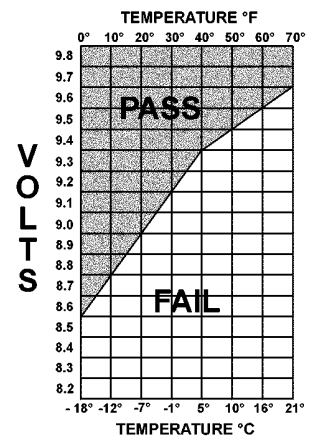
- 3.6.1. Disable ignition system (remove fuse or similar) so that engine will not start.
- 3.6.2. Carry out a load test (para. 3.2.), if not already done, and note voltage reading.
- 3.6.3. Use the table below to determine the equivalent minimum cranking voltage.

LOAD VOLTS	10.2	10.4	10.6	10.8	11.0	11.2	11.4
MIN CRANK VOLTS	7.7	8.2	8.7	9.2	9.7	10.2	10.6

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

- 3.6.4. Connect the tester as in 3.2 and ensure that the load control is OFF.
- 3.6.5. Operate the starter motor and note the voltage during cranking.
- 3.6.6. 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.
- 3.6.7. After test reinstate ignition system.

BATTERY LOAD TEST TEMPERATURE COMPENSATION CHART



<p>Declaration of Conformity We, the sole UK importer, declare that the product listed below is in conformity with the following standards and directives.</p>	
<p>12V Battery Tester Model: BT91/11</p> <p>89/336/EEC EMC Directive</p>	<p style="font-size: 2em; font-weight: bold;">CE</p> <p>The construction file for this product is held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.</p> <p>Signed by Mark Sweetman 7th December 2004</p> <p style="text-align: center;"><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 product.
WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.
INFORMATION: For a copy of our catalogue and latest promotions call us on 01284 757525 and leave your full name, address and postcode.

	<p>Sole UK Distributor Sealey Group, Bury St. Edmunds, Suffolk.</p>	<p> 01284 757500</p> <p> 01284 703534</p>	<p> www.sealey.co.uk</p> <p> sales@sealey.co.uk</p>
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