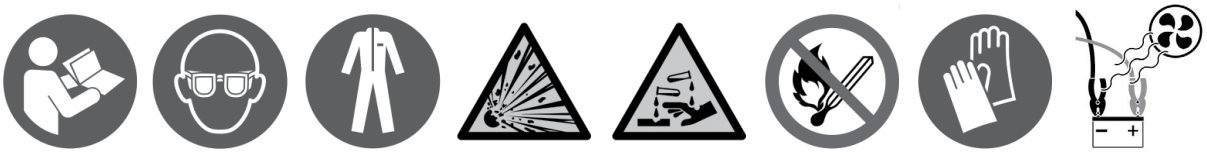
INSTRUCTIONS FOR

PROFESSIONAL BATTERY DROP TESTER 6/12V - POLARITY FREE

MODEL NO: **BT91/7PF**

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 Clothing | Warning: Explosive Material | Warning: Corrosive material | No open flames | Wear Protective Gloves | Battery: Ventilate area

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 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 6 or 12 volt and not 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** pull the cables or clamps from the battery terminals.
- × **DO NOT** use the tester 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.
- × **DO NOT** operate the load 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.)

2. INTRODUCTION

American pattern drop tester. Polarity protected cables - impossible to damage unit by misconnection. Load applied by internal switchgear - no sparking! Suitable for 6 and 12Volt batteries. Applies load across cells and measures output on meter. Accurate indication of battery voltage, faulty cell and short circuited cell.

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 that it is 6 or 12 volts.

3.1.2. Clean battery terminals. If possible, check electrolyte levels and top up with distilled water as necessary.

3.2. **Connection**

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

3.2.1. 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. Correct connection is indicated by the meter pointer (fig.1) moving to the right, up the scale.

3.2.2. If the pointer moves to the left then the clamps should be reversed. If the pointer does not move at all there is either a bad connection or the battery is completely dead.

3.2.3. 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, meter should be easily visible and load switch accessible.

fig.1

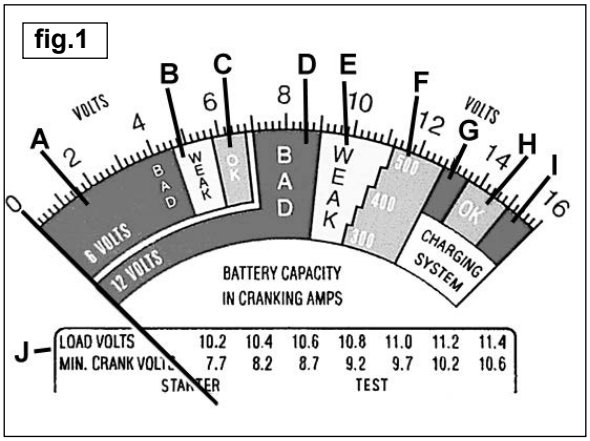
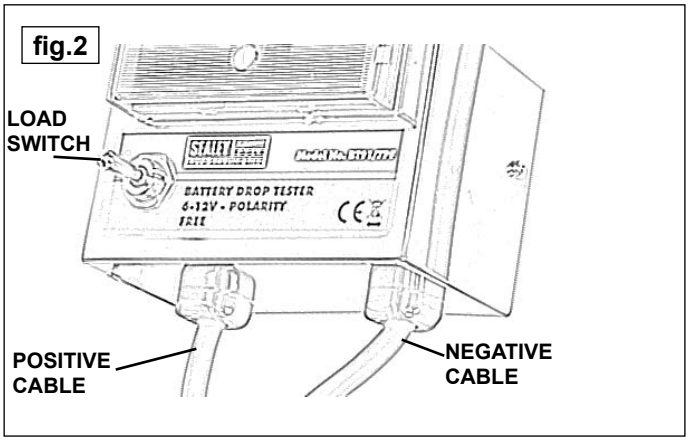


fig.2



3.3. **Battery load 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 COILS AND IS NORMAL.

3.3.1. Press load switch (fig.2) and hold until meter reading stabilizes, 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 meter reading and then release load switch.

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

Notes:

a) For 12 volt batteries the green sector (fig.1.F) border is marked with nominal cranking current from 300 to 500 amps and stepped in 50 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 Fig.1F - 12v Fig.1B - 6v	Battery capacity is good. May or may not be fully charged. Check electrolyte specific gravity to determine charge state. If not fully charged check charging system for fault (paragraph 3.6) or electrical drain.
Bad or Weak - red or yellow, but reading steady. Fig.1D/E - 12v Fig.1A/B - 6v	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 sulphated or has lost active material.
Bad or weak - red or yellow, but reading falling after 10 seconds on load.	Battery may be defective. Release load switch and note meter reaction. 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 - meter reading with load switch 'Off'.

3.5.2. 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	20
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 (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.H). **DO NOT press the load switch.**

3.6.3. Switch on head lights 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.G) 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.I) 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 (para. 3.3.), if not already done, and note voltage reading.

3.7.3. Use the table on the meter (fig.1.J) 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

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 min. cranking voltage for the 6 volt system and then proceed from 3.7.4.

Environmental 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 off any fluids (if applicable) into approved containers and dispose of the product and the 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.*

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.

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