

How to use
domestic
electrical
test meter

The Mighty Meter

The Mighty Meter

You are now the owner of our new Domestic Electrical Test Meter. This instrument is specially designed to simplify the finding of electrical faults and problems in and around the house.

In order to help you make the fullest use of your Mighty Meter, we have included a straightforward set of instructions and examples. This will enable you to identify and isolate basic electrical faults quickly, effectively and safely. Use the meter properly and you will find it an invaluable tool.

Examine your Test Set and you will find it has an easy-to-read meter, a choice of surface contacts, a three pin plug socket, a set of test leads and a mains test plug. These are housed in an attractive high impact plastic case which has been designed to help you best use this instrument. So that you will understand each function of the Test Set, the

relevance of each part is described below and indicated in the diagram overleaf.

PARTS

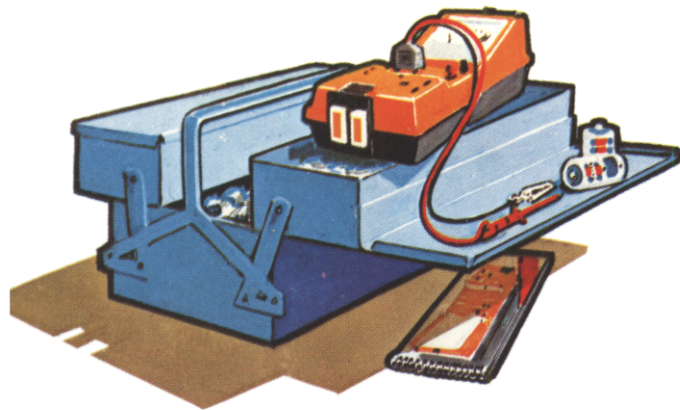
ON/OFF Switch – Activates the two HP7 batteries (Not supplied with the meter – purchase separately and insert as indicated) housed in the instrument which power the meter. A red light alongside the switch indicates that the meter is ready to use.

THE METER A first grade moving coil meter with a continuity segment, a 3 volt scale, and a 15 volt scale. The continuity segment is a visual guide to the continuity of an electrical circuit. The 3 volt and 15 volt scales are for indicating various battery strengths up to 15 volts. There is also a Set Meter control for adjusting the full scale deflection of the meter needle.

TEST PUSH BUTTON – Completes appliance continuity circuits upon depressing.

SURFACE CONTACTS – Two types are incorporated into the instrument – for bulb and fuse testing.

SOCKET CONTACTS – For use in conjunction with the test probe. Use 'CONT' when checking continuity – '3 Volt' when testing any battery up to 3 volts – and '15 Volt' when testing any battery up to 15 volts.



TEST PROBE — A test lead with pump action probe (simply retract the appropriate section of the plastic probe to expose metal for testing) and crocodile clip fitted with a non-reversible plug which matches the socket contacts described above. Red for positive (+) and black for negative (–) when testing batteries or voltages.

3 PIN SOCKET — For instantly testing continuity of appliances.

TEST PLUG — Housed in the instrument, it can be detached by pulling out and used for safely completing various live mains socket tests.

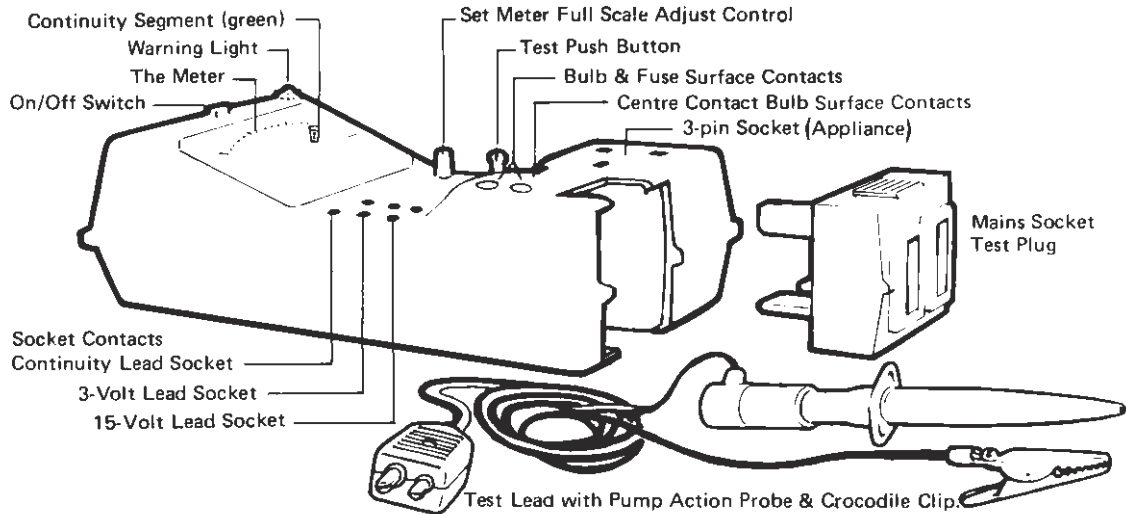
IMPORTANT USES

HOME TESTING — Electric fires, toasters, hairdryers, washing machines, flat irons, dryers, fridges, freezers, vacuum cleaners, table, standard lamps, Christmas tree lights and other household appliances.

GARAGE — Electric drills and power tools in general. Car fuses and bulbs, car battery and charging systems.

GARDEN — Electric mower and power tools. Extension leads, battery driven mowers.

HOBBIES — Electric trains and cars. Model controllers.



The Mighty Meter

Index

Warning **ELECTRICITY CAN KILL**

This instrument should on no account have mains power running through it or be connected to a mains socket in any way. (See 'Testing Mains' for use of mains socket test plug).

When using the Mighty Meter for testing, appliances etc. should NEVER be connected to a mains socket. In the interests of safety, always carefully read the instructions provided before attempting to complete any of the described tests in this booklet.

Apply logic to your testing

Testing fuses and light bulbs

Testing for continuity

Testing continuity of appliances

Testing mains

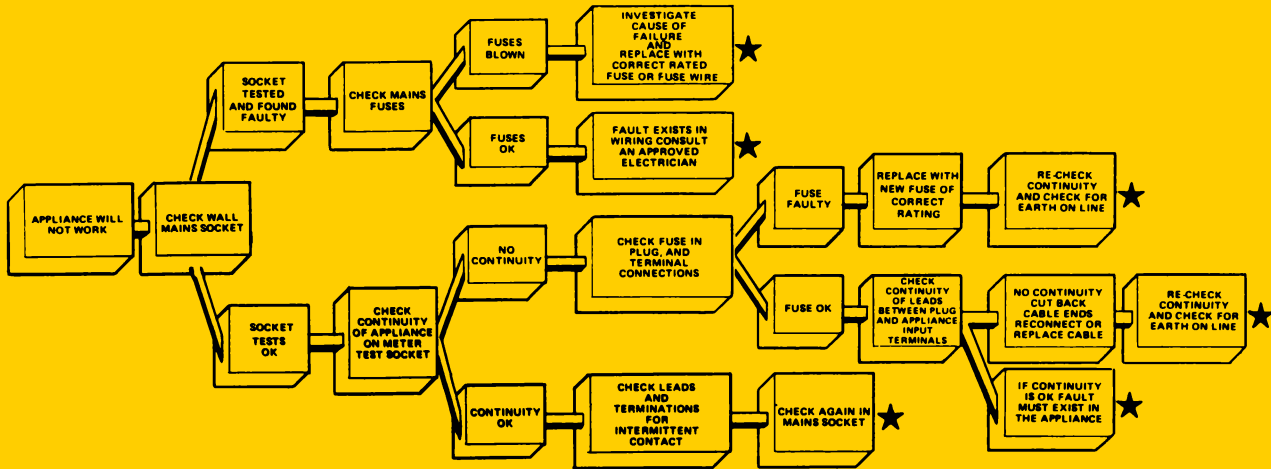
Checking batteries

Car check 12v charging/starting

Electrical toys

Example tests

The meter self test/batteries

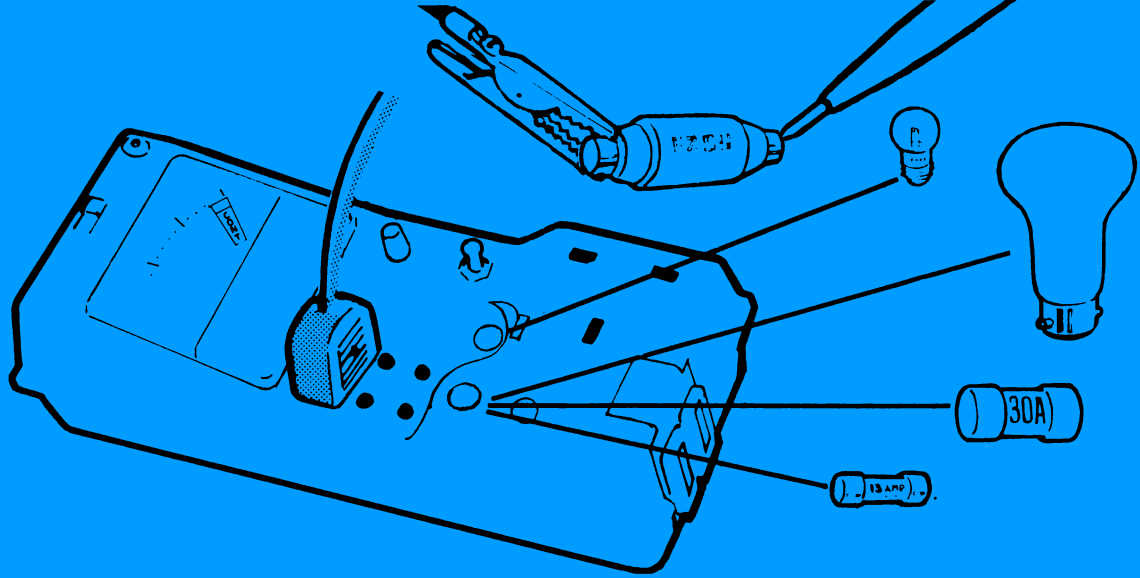


★ IF FAULT STILL OCCURS CONSULT AN ELECTRICIAN

Apply logic to your testing

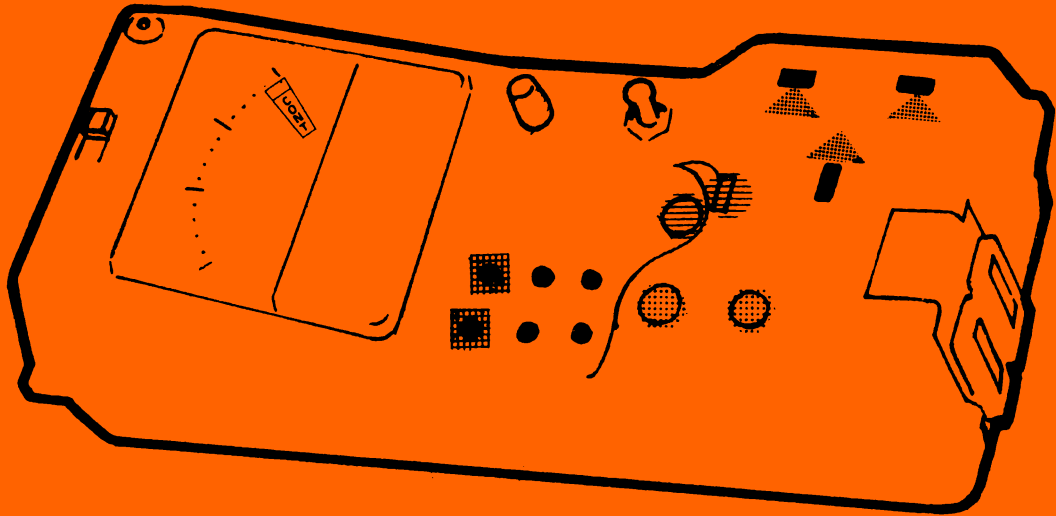
Use of logic Diagram

The logic diagram opposite has been included in this instruction booklet in order to provide you with a constant 'easy to follow' test procedure when using your Mighty Meter. Having made the initial test i.e. check wall mains socket, the result will indicate the next path to take on the diagram. Subsequent paths will of course be decided by each new test.



Testing fuses and light bulbs

1. Switch on Mighty Meter and self test, as indicated at the back of this instruction booklet.
2. Hold fuse or bulb in good contact with the appropriate surface contacts, or in the event of a large component use test leads plugged into continuity sockets (CONT.)
3. A good fuse will indicate full scale deflection of the needle.
4. A good bulb will show a deflection depending on the resistance of the filament, as a general rule it will be in or near the green segment.
5. No deflection of meter will indicate faulty bulb or fuse.



Testing for continuity

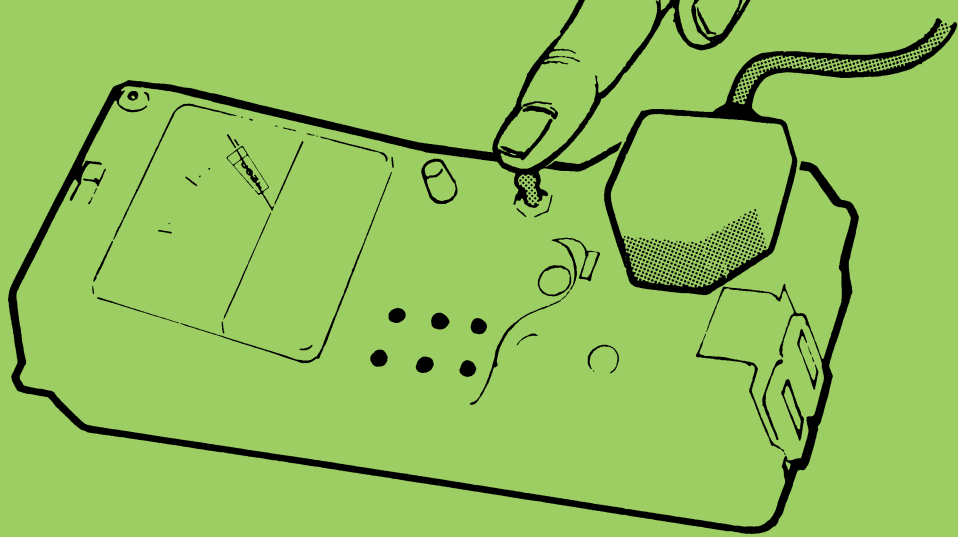
Since continuity (a continuous circuit with no broken wires or components) is an important part of electrical testing, four outlets are conveniently provided.

1. Continuity socket (CONT.) for test leads.
2. Surface contacts for fuse and bulb tests.
3. Centre and side contacts for screw bulbs.
4. 13 amp test socket for appliances.



The internal batteries (2 x HP7) power the meter for all continuity testing and the meter zero control compensates for variations in the state of these batteries.

To prepare the meter for continuity testing, switch on, and self test as indicated at the back of this instruction booklet. Should the pointer not move far enough across the scale in spite of the set meter being turned fully clockwise, the batteries should be removed and renewed.



Testing continuity of appliances

When an Appliance is being tested using the Mighty Meter, only a safe 3 volt DC current is passed through the Appliance and its leads. This voltage may not be enough to show a breakdown in the circuit and/or insulation which would occur under the mains voltage of 240 volts AC. If after applying all the relevant tests with the meter (see Logic Diagram) an appliance fault still occurs, CONSULT A COMPETENT/QUALIFIED ELECTRICIAN

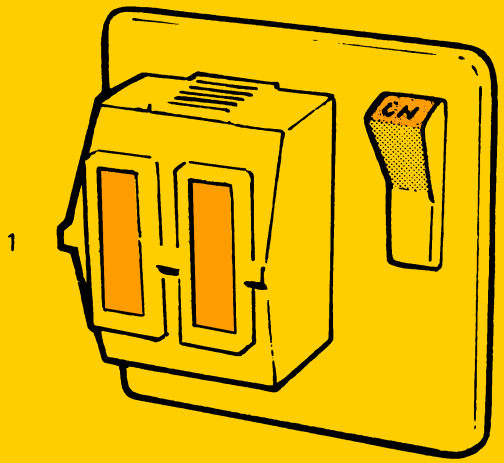
1. Switch on your Mighty Meter, and self test as indicated at the back of this instruction booklet.
2. Place appliance 3 pin plug into Appliance Test Socket with the appliance switch in the ON position.
3. If at this stage a reading is obtained without pressing Test Push Button, a short circuit exists between the green/yellow wire and either or both of the other two. This should be cleared before proceeding by disconnecting complete lead from appliance and also re-checking to assess if fault exists in appliance or lead.
4. Push Continuity Test Push. If the circuit is continuous the meter will indicate on or near the green segment depending on the electrical resistance of the appliance.
5. In the event of No Reading then after checking the fuse, check the lead continuity between plug terminals and appliance input terminals.
6. Should the fuse and leads show continuity, check with test leads the continuity of the appliance from the input terminals.

To test continuity of appliance leads

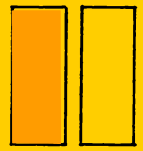
Apply Test leads of meter to each end of the wire enclosed in the same colour leads, to form a continuous circuit.

- (a) – red (or brown) live wire.
- (b) – black (or blue) neutral wire.
- (c) – green (or green/yellow) earth wire.

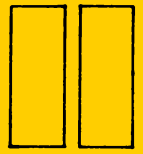
If no fault is found at this stage, the fault must exist in either the element, the thermostat or the switch.



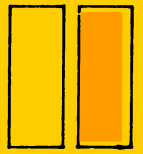
2/3



4



5



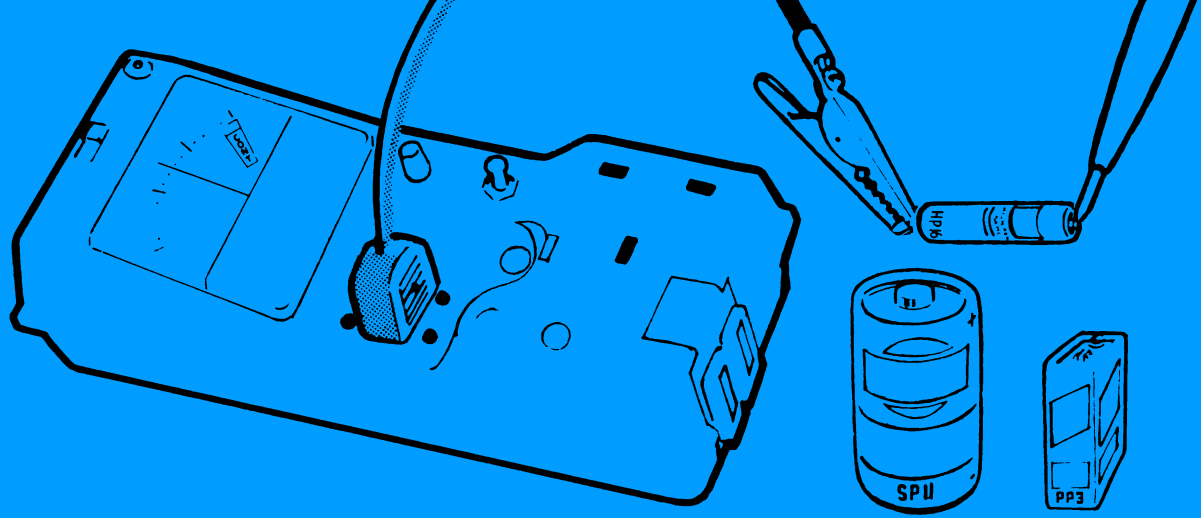
Testing mains

1. Remove Mains Test Plug from meter by pulling outwards and push this 3 pronged plug into the mains socket on wall. Switch mains on. When both amber lights are showing this indicates that the power is on and that the socket is wired correctly.

2. If only the left amber lamp is showing, this indicates that
3. the power is on and the earth is disconnected . . . or that the power is on and live and neutral are reversed.
4. In the event of neither amber lamps showing. This means that: –
 - a) – The earth and neutral have become disconnected, or
 - b) – The switch may be faulty, or
 - c) – The power may be off or live disconnected.
5. Should only the right amber lamp show, this indicates that power is on and the neutral is disconnected.

WARNING: Should the mains socket prove faulty, no work should be carried out without first turning off all the house mains switches. These are usually found next to the house meter record.

SAFETY NOTE: Do not under any circumstances insert test probe into Mains Socket.



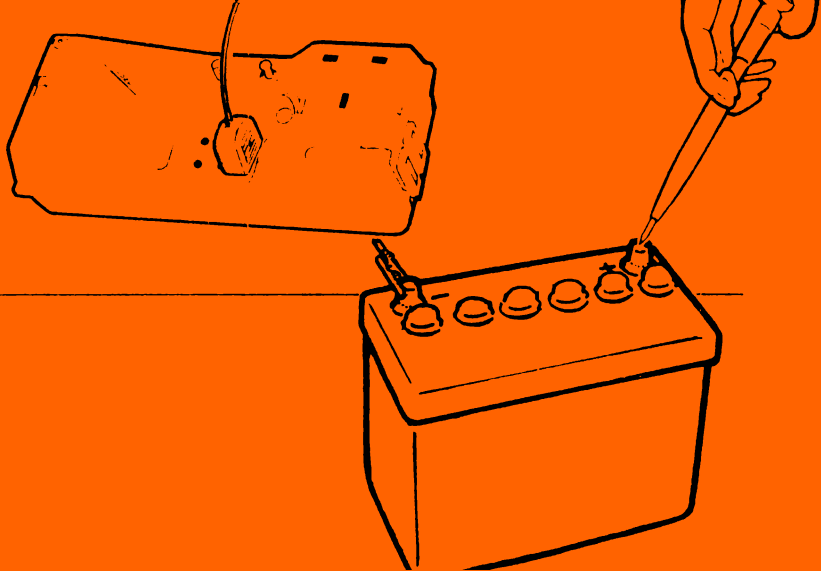
Checking batteries

1. Plug in Test Leads of the Mighty Meter to one of two voltage sockets on the meter and switch ON.
The actual choice of socket depends on the battery voltage indicated on the battery itself and the socket used is always the higher number i.e. 1.5 volt battery is tested by placing the leads in the 3 volt holes.
2. Apply firstly crocodile clip to black lead (negative -) terminal of battery, and the Test Probe to red lead (positive +) terminal of battery, and read off the scale selected.
3. A more accurate indication of the state of the battery may be gained by taking the reading whilst the battery is on load. This, however, is not always easy.

Car check

12v charging

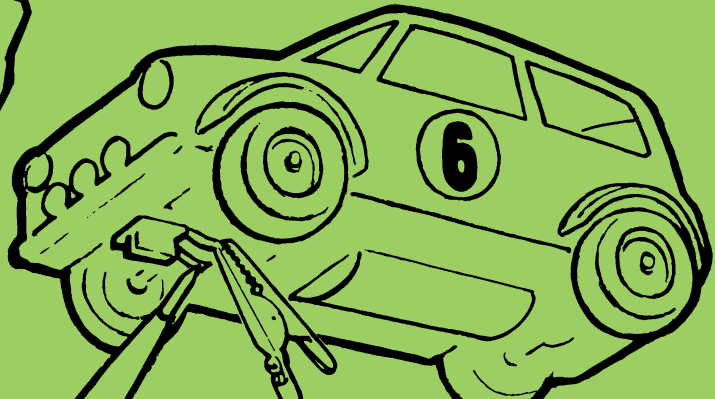
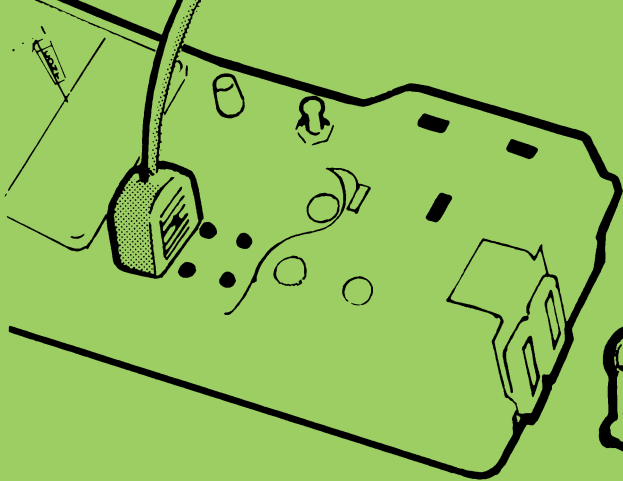
12v starting



1. Plug Test leads into 15V socket (switch ON meter) and connect meter across the battery. Reading should be approx. 12 to 13 volts. It is important that the correct leads, black for negative (—) and red for positive (+) are connected to the appropriate battery points.
2. Start the car engine and depress accelerator linkage for engine to run until reading stabilizes. The voltage should rise slowly and become stable.
3. For cars fitted with Alternators Type Nos. (Lucas) ACRs 15-16-17-18, the needle should deflect about 14 volts on the meter scale.
For cars fitted with dynamos and 340 control boxes needle will deflect to almost 15 volts on the scale.
4. The test can only be accurately made with a fully charged battery.
For Foreign cars consult your vehicle handbook to obtain control voltage of charging system.

SAFETY NOTE: Do not smoke or use naked flame near car batteries.

1. Plug Test Leads into 15 volt socket. Switch ON meter and connect meter across battery ensuring the polarity is correct, red to positive (+) black to negative (—) leads. Voltage reading should be 12 volt to 13 volt.
2. Disconnect CB or negative wire from coil so that engine will not start.
3. Operate starter. With the engine turning over, the voltage should not drop to less than 9 volt.
A lower voltage would indicate: — (A) or (B).
 - a) A discharged battery or a faulty battery.
 - b) Starter motor taking too much current.A voltage of 10 or more with very slow cranking speed would indicate: — either (A), (B), or both.
 - a) A faulty starter motor.
 - b) High resistance connections on battery leads or engine earth leads or starter connection.

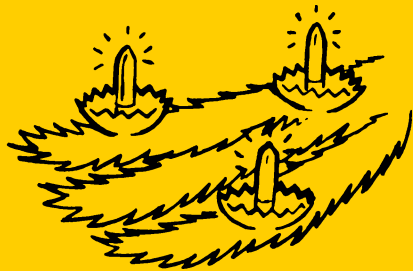


Childrens Electrical toys with motors

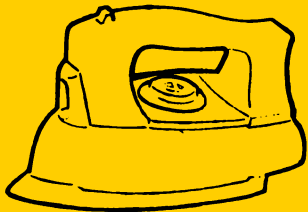
1. Plug in Test Leads to continuity socket (CONT.) and self test as indicated at the back of this instruction booklet.
2. Connect Meter across motor terminals with Test Probe and crocodile clip. Good connection within the motor will be indicated by a full scale reading (green segment), which should be maintained even when turning the armature.
3. Faulty brush contact or open circuit armature will be indicated by the reading fluctuating.
4. Broken wires would also be indicated by no reading.

Example tests

Christmas tree lights



Steam iron



SAFETY NOTE: Mains plug must be disconnected from wall socket before attempting any work on Christmas tree lights.

1. Switch ON Meter, and self test as indicated at the back of this instruction booklet.
2. Check continuity of fuse in mains plug.

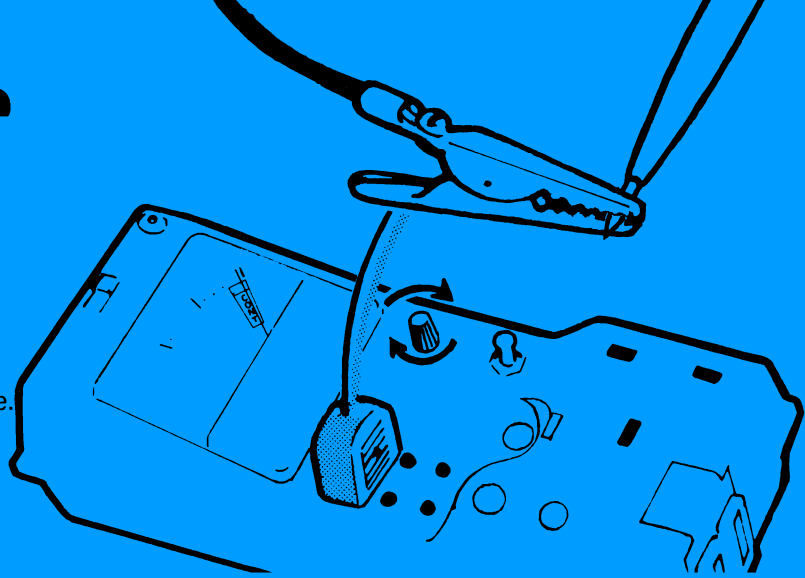
3. Remove each bulb and check continuity on bulb test contacts. A full scale deflection (green segment) shows a good bulb.

4. In the event of all bulbs showing good, a fault may exist in the leads from the plug to the lamp holders or between bulb holders.

-
1. Apply appliance test.
 2. Use surface contacts for fuse test.
 3. Use test leads to test continuity of:
 - a) – red (or brown) live wire.
 - b) – black (or blue) neutral wire.
 - c) – green (or green/yellow) earth wire.If no fault is found at this stage, the fault must exist in either the element, the thermostat or the switch.

The Meter self test

Switch on Mighty Meter and short circuit the continuity contacts by means of inserting test leads into continuity socket and joining crocodile clip to Test Probe. Adjust to full scale deflection (green segment) of the needle with set meter control (then disconnect).



The Meter batteries

Mighty Meter is powered by two HP7 batteries housed at the back of the instrument. Simply remove the cover by sliding action and insert batteries into the correct positions as illustrated and marked.

NOTE: Remove batteries when storing Meter for long periods.



The Mighty Meter

Warning ELECTRICITY CAN KILL

We would like to point out that whilst the instrument is safe in itself, the testing of mains sockets should only be done according to the instructions and preferably NOT in the presence of children who may be tempted to repeat the experiment in your absence.

DO'S and DONT'S

Do not allow children to play with the instrument.

Do not leave exhausted batteries in the instrument.

Do switch on instrument before taking a reading.

Do remember to switch off afterwards.

Double check to see the correct facility is selected.

Keep the instrument dry.

Electrical repair work resulting from tests carried out on mains sockets should only be attempted with mains switches OFF. For the purpose of testing, appliances should on no account be connected to a mains socket.