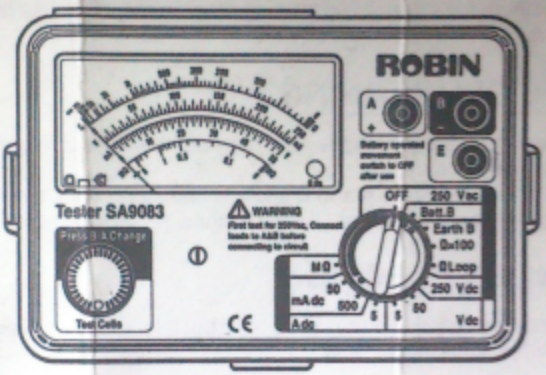
INSTRUCTION MANUAL



TESTER
SA9083

Mk 18

ROBIN

INTRODUCTION

The Tester SA9083 is a Multi-meter type instrument with general purpose current and voltage ranges and special ranges for testing telephone lines.
Intended for use by faultsmen, it provides the facilities of a Test Desk. These instructions are guidance only and are not a substitute for a structured training programme in the use of this product.

SAFETY / WARNING

When measuring voltages always select the highest range and use extreme care.
Initial checks: Short A and B sockets and select loop, the needle should deflect to 0 Ohm. If LED flashes, replace battery.

RANGE SELECTION

Range selection is provided by a 12 position rotary type switch with the following facilities:

Range 1	-	250V ac mains
Range 2	-	Test battery A, B
Range 3	-	Test earth A, B
Range 4	-	Ohms x 100 insulation resistance
Range 5	-	Ohms loop resistance
Range 6.7.8	-	250V dc, 50V dc, 5V dc
Range 9.10.11	-	5A dc, 500mA dc, 50mA dc
Range 12	-	M. Ohms

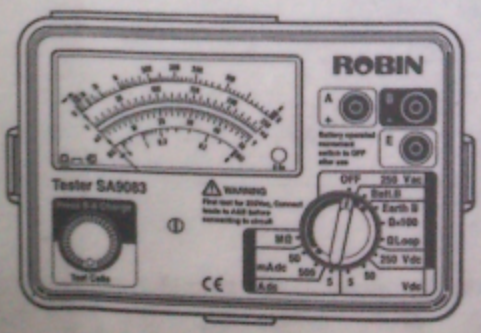


Fig. 1

GENERAL RULES

To be carried out before using the tester:

(i) Check Tester Needle

Check that the tester needle is pointing to zero on the scale marked "V" and "mA" with all test leads disconnected and the range switch in the 250V ac (Range 1).

Always connect (unless otherwise stated):

"A" terminal (RED LEAD) to A wire
"B" terminal (BLACK LEAD) to B wire
"E" terminal (GREEN LEAD) to earth

(ii) Check Battery

Check battery condition as follows:

Fit cells into tester.

Set range switch to ohms x 100.

Connect red and black test leads together.

Check red lamp glows under glass. If this is flashing then replace the batteries.

The tester needle should move to the right hand side of the scale when the battery is in good condition.

(iii) Safe parking position

Immediately before and after use set the range switch to the position marked 250V ac for the following reasons:

- It provides some protection for the sensitive tester during transit and saves battery life.
- Should you overlook to set the tester to the correct range, no harm will come to the tester when you apply the test spikes to the customer's line.
- The tester is set correctly for the first test you need to make.

(iv) Measurement

Do not switch between types of measurement until test leads are disconnected from circuit under test.

TESTING

(i) AC Mains

Set range switch to 250V ac.

DISCONNECT GREEN EARTH LEAD BEFORE CARRYING OUT THIS TEST.

Use Red and Black Test leads with Spikes Test connected. Test between each wire and earth and then between wires.
Note: It is possible to have a full mains contact measuring 240V ac but in practice it is more likely to measure something less than 240V ac.
The tester should now be disconnected from the pair under test before proceeding with test for DC voltage.

IMPORTANT: If, on testing for AC mains, a reading is obtained no matter how small WORK MUST CEASE as mains may be present and all information passed to your control.

(ii) DC Voltages

This test is for indicating faults or voltages over 50V dc which could damage the tester i.e. teleprinter lines which use 80V dc positive and negative.
The method of testing is:

- Set range switch to 250V dc (Range 6).
- Connect red and black leads to tester. Do not connect the green lead.
- Test between each wire and earth and between wires (black lead of tester to earth, red lead of tester to 'A' leg of pair, 'B' leg of pair). If there is no needle movement, test across pair (red and black leads to 'A' and 'B' legs).

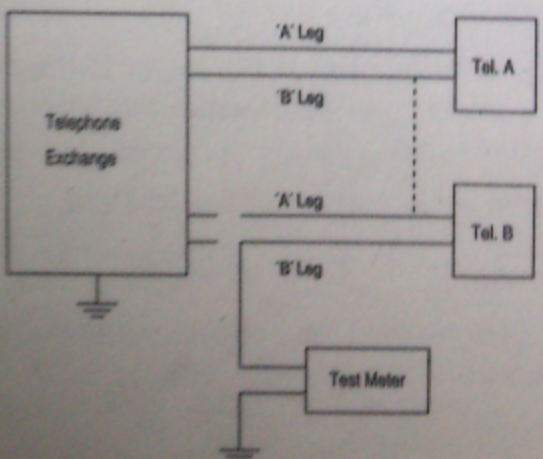


Fig. 2

- 0 - 250V dc (Range 6)
- 0 - 50V dc (Range 7)
- 0 - 5V dc (Range 8)

Note: With the range switch set in any of the above positions the tester can be used as a simple detector.

(iii) Battery B/A

With earth terminal to earth, A + terminal to A leg, and B - terminal to B leg.
Set range switch to position 2 (Battery B).
Movement of the meter needle indicates whether a battery fault exists on the B leg.
Movement on the meter needle indicates whether a battery fault exists on the A leg.
Press the line reverse button this reverses the connection and tests the A leg (it is possible to have a battery fault on both legs).
If a battery fault is discovered you may want to switch to range 6 to confirm the magnitude of the battery voltage.

(iv) Earth B/A

With earth terminal to earth, A + terminal to A leg, and B - terminal to B leg.
Set range switch to position 3 (Earth B).
Movement of the meter needle indicates whether an earth fault exists on the B leg.
Press the line reverse button this reverses the connection and tests the A leg.

(v) Disconnection

Disconnection of one leg.
Set range switch to ohms x 100 (Range 4) with A + terminal to 'A' leg and B - terminal to earth.
Press line reverse button.
Note amount of deflection of meter needle.
Connect A + terminal to 'B' leg.
Press line reverse button.
Note amount of deflection of meter needle. Compare these two deflections.
If there is a noticeable difference then the leg with the smallest amount of difference is disconnected.
If there is no noticeable difference then we can assume that both legs are disconnected.

(vi)Insulation Resistance

The tester is most vulnerable when used on the Ohms x 100 scales. Make sure that no battery fault exists before using this range.
Connect the earth terminal to a good earth, A + terminal to 'A' leg and B - terminal to the 'B' leg.
Set range switch to Ohms x 100 (Range 4).
Take readings from the scale, do not forget to multiply this reading by 100.
Sometimes low insulation can occur from 'A' leg to 'B' leg but not from 'B' leg to 'A' leg.
It can also happen in the reverse direction.
This type of fault is called 'polarised' therefore the line reverse button will have to be pressed to check for low insulation in both directions.
If the reading is of a high value i.e. millions of ohms, a more accurate reading can be achieved by using the 0 - 5M (Range 12) as follows:
With earth terminal to a good earth, A + terminal to 'A' leg and B - terminal to 'B' leg.
Switch to M ohm range (Range 12).
The reading taken from the M ohm bottom scale will be the resistance to earth of the 'B' leg. Press the line reverse button.
The reading taken from the bottom M ohm scale will be the resistance to earth of the 'A' leg.
To test between the 'A' and 'B' legs:
Connect earth terminal to the 'A' leg and the B - terminal to the 'B' leg.
A reading of 1M ohm is the minimum for a working circuit (more than 2 M ohms is preferable).

LOOP / SHORT CIRCUIT

A loop or short circuit will be indicated by the needle moving from the left to the right hand side of the top ohms scale.
A measurement can be taken by switching the range to loop (Range 5), do not multiply by 100 as the reading will indicate the loop resistance of the pair.

BALLISTIC TEST

(i) An exchange line has incorporated within its circuitry, at the customer's end, a capacitor.
This component can be detected by testing the line.
Set range switch to ohms x 100 (Range 4).
With A + terminal to 'A' leg and B - terminal to 'B' leg.
Press and release the line reverse button.

The meter needle should show a capacitor 'kick' and restore.

This indicates a capacitor connected across the 'A' and 'B' legs.

(ii) An exchange has capacitance coupling between the pair. This can be detected by testing the line.
Set range switch to ohms x 100 (Range 4).
With A + terminal to 'A' leg and B - terminal to 'B' leg.
Press and release the line reverse button repeatedly.
The needle should show a capacitance kick.
This may be used as a guide to estimate the distance to a fault.

SERVICING

If this tester should fail to operate correctly, return it to Robin Electronics marked for the attention of the Service Department, stating exact nature of fault. Make sure that:
a. Operating instructions and field practice has been followed.
b. Leads have been inspected.
c. The unit is returned with all accessories.
d. A note is supplied describing the fault.

Robin Electronics Ltd
Precision Centre
Dwight Road
Watford
Herts
WD1 8HG

Tel: 01923 232000
Fax: 01923 222612

KIT276 & 684 RESISTANCE VALUES

The following table allows the Tester SA9083 (Mk 18) to be used in place of the Tester 231A

(KΩ X100) A-B	Kit* Resistor No.	Resistor Value KΩ
2.9	1	300
1.43	2	150
0.89	3	91
0.66	4	68
0.50	5	51
0.42	6	43
0.345	7	36
0.296	8	30
0.237	9	24
0.198	10	20
0.178	11	18
0.144	12	15
0.126	13	13
0.108	14	11
0.088	15	9.1

- *Kit 276A (314007), Kit 684A (437046), Kit 684B (437047)
- *Kit 684C (437048)

OFFICIAL LIST OF SPARE ACCESSORIES

Product	Item Code	Issue
Spike Testing 10A	334743	(2 off supplied)
Clip Test 44A Red	314604	(1 off supplied)
Clip Test 44A Black	314603	(2 off supplied)
Clip Test 41A	313945	(not supplied)
Cord Test 1 /1500A Black	334906	(not supplied)
Cord Test 1 /1500A Red	334907	(not supplied)
Cord Test 1 /1500A Green	334908	(not supplied)
Cord Test 1 /9083A Red	315574	(1 off supplied)
Cord Test 1 /9083A Green	315575	(1 off supplied)
Cord Test 1 /9083A Black	315576	(1 off supplied)
Batteries (6×LR6)	171417	(not supplied)
Protective Case	contact supplier	(1 off supplied)
Instruction Manual	contact supplier	(1 off supplied)

92-1367B 99-04

ROBIN ELECTRONICS LIMITED

Precision Centre
Dwight Road, Watford, Herts
WD1 8HG, England
☎ Sales Order Line 01923 218744
☎ Administration Line 01923 232000
Fax 01923 218890