Chapter 3

TAILPLANE HEATER MAT TEST SET

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Tailplane heater mat test set .... **Ref. No. 26DM/95117**
Dimensions (*in.*) .... $4 \times 4\frac{1}{2} \times 3$

Introduction

1. The tailplane heater mat test set is designed to facilitate measuring the resistance and insulation of the de-icing mats of the tail and fin. When coupled to the aircraft system it provides an easy means of connecting an ohmmeter between any two phases of the mats and an insulation resistance tester between the three mat phases and earth.

DESCRIPTION

2. This test set GE2559 (*fig.* 1) is a rectangular wooden box, which has a four position, two wafer, rotary switch and six terminals mounted on it. Three terminals, marked A, B and C on the box, are for connecting to the three phases of the heater mat. The terminals marked AVO are for connection to a multimeter Type 1 (Ref. No. 10S/16411), whilst that marked MEGGER is

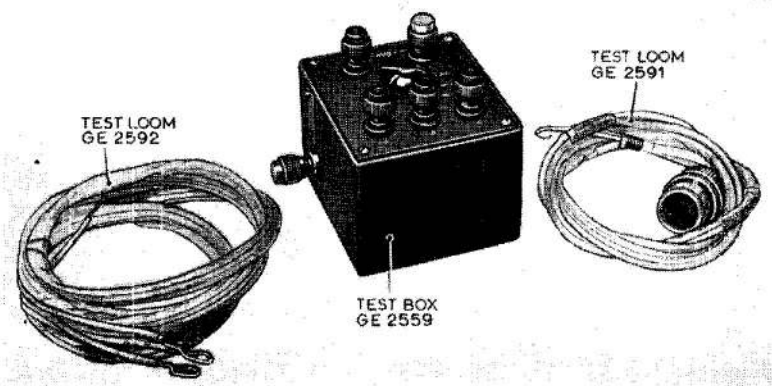

Fig. 1. Tailplane heater mat test set

for connection to an insulation resistance tester Type A (Ref. No. 5G/1621).

3. Two sets of connecting leads are also supplied for use with the test box. Both sets of leads comprise three cores; one end of test loom GE2592 is terminated in spade terminals with bared cores at the opposite end, whilst with test loom GE2591 the spade terminals are replaced with a free socket.

OPERATION

4. The moving contacts on one wafer of the switch (*fig.* 2) are connected to the AVO terminals whilst those on the other wafer are associated with the MEGGER terminal. When in the OFF position the moving contacts are not connected to any external circuit. In switch positions AB, AC and BC however the AVO terminals are connected to terminals A and B; A and C; and B and C respectively. In the MEGGER position the switch connects the MEGGER terminal to all three of terminals A, B and C.

OPERATING INSTRUCTIONS

Elevator horns (*fig.* 3)

5. The test box should be used in conjunction with the test loom GE259.

(1) At the stern break TB/DC/1P, remove the two earth leads from the block as shown in fig. 3, to isolate the mats from earth.

(2) Connect the ohmmeter to the test box GE2559.

(3) Connect the spade terminals of test loom GE2592 to the test box.

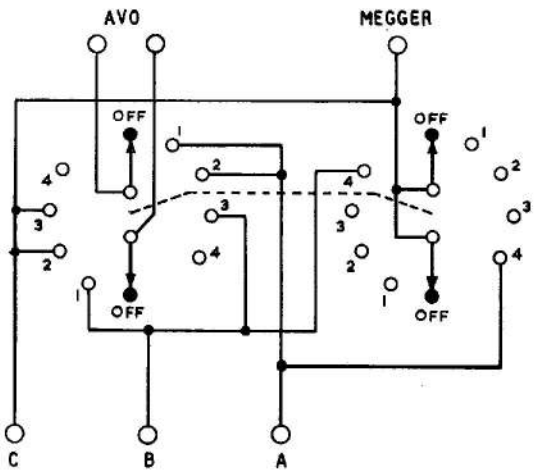

Fig. 2. Circuit diagram

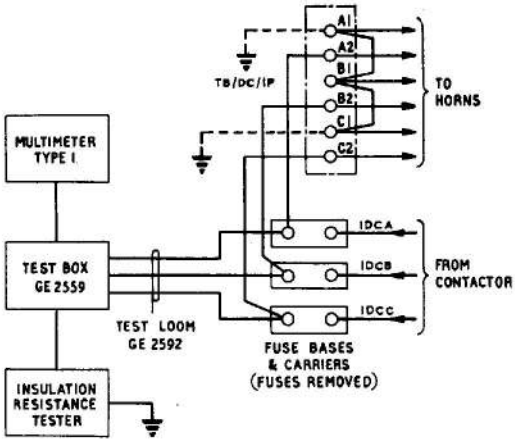

Fig. 3. Elevator horn test connections

(4) At panel ED40 remove fuses 1DCA, 1DCB and 1DCC from the carriers and connect the bare ends of the test loom to the fuse bases on the output side and secure by means of empty fuse carriers.

(5) Take resistance readings from the ohmmeter with test box selector switch in positions AB, AC and BC, and compare the readings with the values given in A.P.4682A, Vol. 1, Book 2, Sect. 5, Chap. 1, Group H.

(6) Connect the insulation resistance tester between the test box and the aircraft structure.

(7) With the selector switch in the MEGGER position check the circuit insulation resistance.

(8) This completes the test for the port side, repeat the procedure for the starboard side at TB/DC/1S removing fuses 2DCA, 2DCB and 2DCC.

Note . . .

The elevator horn heater mats are operated from the 112V d.c. supply; for the purpose of this test the mats are connected in a star configuration and may be likened to a three-phase mat network.

Continuous load (*fig.* 4)

6. The test loom GE2591 and the test box are required for checking the continuous load.

(1) Connect the ohmmeter and loom GE2591 to the test box.

(2) At panel ED24 remove the a.c. sockets from load No. 1 and 2 plugs.

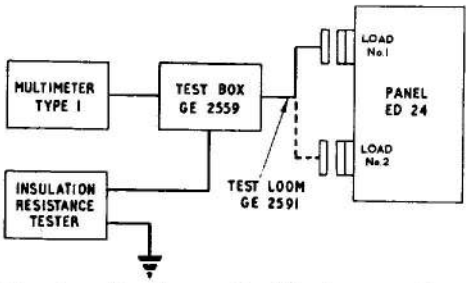

Fig. 4. Continuous load test connections

(3) Connect the socket of GE2591 to load No. 1. Take resistance readings from the ohmmeter with the test box selector switch in positions AB, AC and BC, compare the readings with the values given in A.P.4682A, Vol. 1, Book 2, Sect. 5, Chap. 1, Group H.

(4) Connect the insulation resistance tester between the test box and the aircraft structure.

(5) With the selector switch in the MEGGER position check the insulation resistance of the circuit.

(6) Repeat 1 to 5 with loom GE2591 connected to load No. 2.

Cyclic load (*fig.* 5)

7. Test loom GE2591 and the test box are used in this series of checks. It is an advantage to have intercommunications between the flight deck and the rear freight hold.

(1) Connect the ohmmeter and loom GE2591 to the test box.

(2) Connect the socket of GE2591 to cyclic switch No. 2.

(3) At roof panel F1 select timer No. 2 on the timer switch and switch on the heat switch.

(4) Allow the cyclic switch to make a complete revolution at its slowest rate with the test box selector switch in each of its three positions AB, AC and BC.

(5) Take resistance readings from the ohmmeter and compare them with those given in A.P.4682A, Vol. 1, Book 2, Sect. 5, Chap. 1, Group H. The intervalometer of panel F1 will indicate the mat areas under test.

(6) Connect an insulation resistance tester between the test box and the aircraft structure.

(7) With the selector switch in the MEGGER position check the insulation resistance of the circuit.

(8) Repeat the insulation resistance test only on cyclic switch No. 1; this switch covers primary mat areas only.

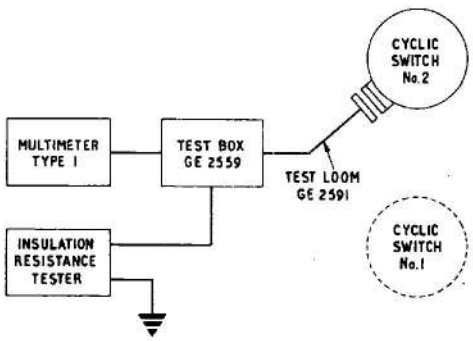

Fig. 5. Cyclic load test connections