Chapter 5

BOOSTER UNIT E934 (GRAVINER EXPLOSION PROTECTION SYSTEM)

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Booster unit E.934 (1)	*Ref. No.* 27N/331
Voltage rating	18 *to* 28·5V *d.c.*
Current rating, input (*pins* A *and* B)	100*mA* (*max.*)
control (*pins* C *to earth*)	185*mA*
Receptacle	GS02–14S–6P–251
Ambient temperature range	—55 *to* 70 *deg. C.*
Dimensions	5·75 x 2·3 x 3·3 *in.*
Weight	1 *lb.*

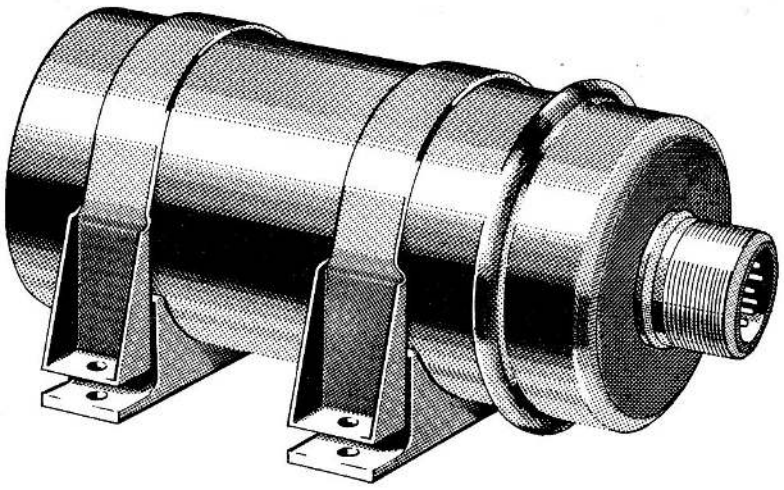

Fig. 1. General view of unit

Introduction

1. The booster unit is a component in the Graviner explosion protection system. Its purpose is to 'fire' the suppressor columns when the crash switch is operated.

2. This chapter gives details of the booster unit only, for further information on the system as a whole, reference should be made to A.P.4343, Vol. 1, Sect. 22.

DESCRIPTION

3. The components are mounted on a board and completely sealed in a stainless steel case. Electrical connection is made by an AN receptacle fitted to one end of the case, this receptacle will accept a CA3106E–14S–6S–C22 plug (or an equivalent). An earthing terminal is provided at the other end suitable to accept a flexible bonding link.

4. Mounting is by two saddle type clamps, each having two $\frac{7}{32}$ in. holes drilled at 2·83 in. between centres. The clamps may be slid along the body to suit installation requirements, it is recommended that the distance between the centre lines of the clamps should be between 2 and 2·5 in.

OPERATION

5. The unit comprises an oscillator, the output of which is rectified and used to charge capacitors C2 and C3. The discharge path for the capacitors is through the suppressor column (s) via a silicone controlled rectifier; the SCR will not conduct until the crash switch operates and raises the potential of the gate.

Oscillator

6. The zener diode MR1 and resistor R6 provide voltage stabilization; resistor R2 is used as an aid to start oscillation on initial application of the d.c. supply. The oscillator is a transformer coupled multivibrator, capacitor C1 will suppress peaks in the waveform.

Output circuit

7. MR2 is a rectifier to provide half wave rectification of the transformer output winding. MR3 zener diode and R3 provide voltage stabilization. MR5 is a blocking diode to prevent C2 and C3 discharging via the transformer winding. When 28V positive is applied at pin C (via crash switch) the potential at the gate of the SCR (MR4) is raised sufficiently to allow it to conduct, this in turn provides sufficient potential across pins D and E to 'fire' the suppressor column(s) i.e. 90–140V with 2A flowing.

SERVICING

8. This is as given in the Standard Serviceability Test at Appendix A. Defective units should be returned for repair in accordance with current authorized procedure, these are field units.

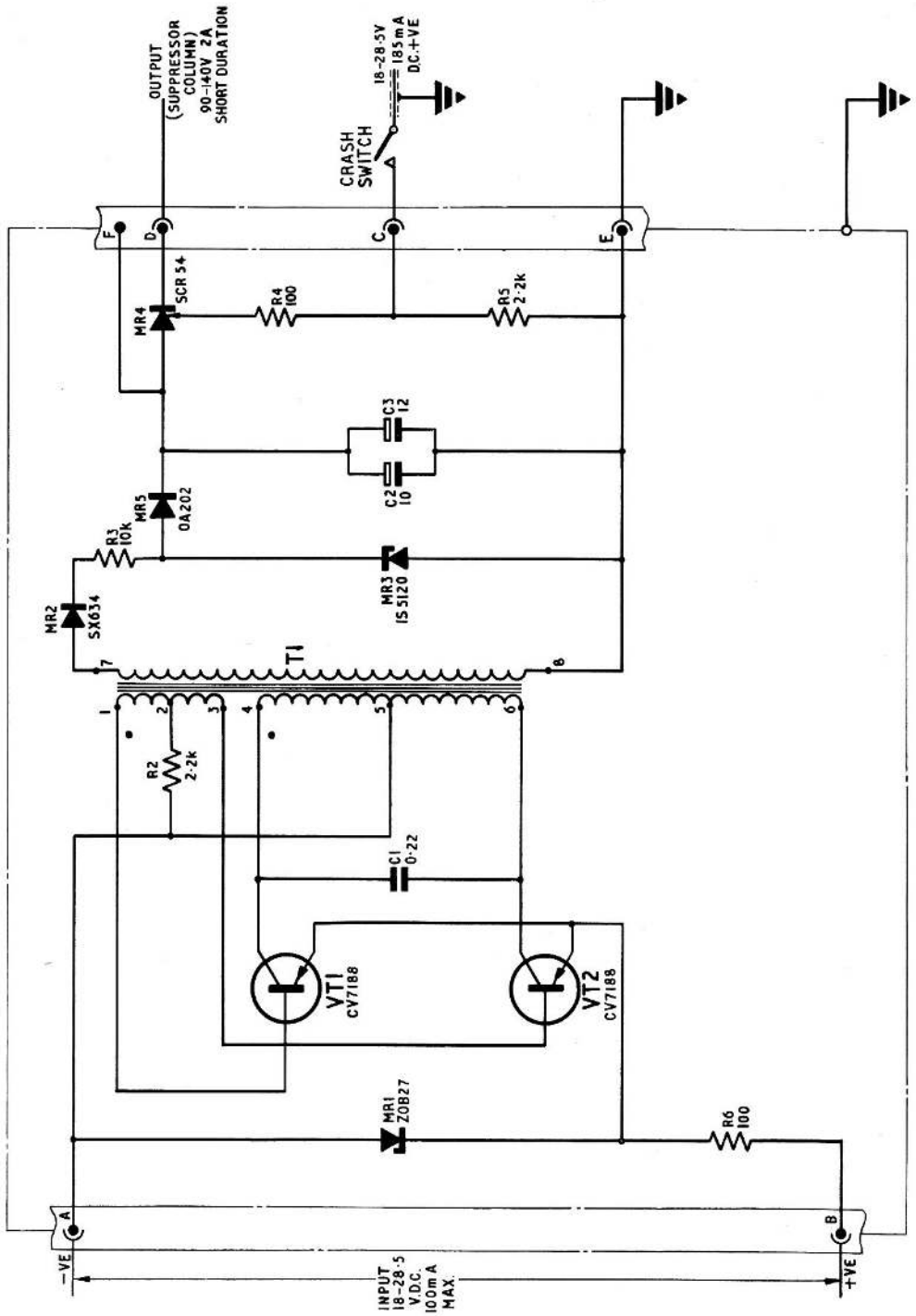

Fig. 2. Circuit diagram

Appendix A

STANDARD SERVICEABILITY TEST

for

BOOSTER UNIT E934

Introduction

1. The following test may be applied to items which are suspected of being defective or prior to installation of a new item to an aircraft system.

TEST EQUIPMENT

2. The following test equipment will be necessary to perform the tests detailed in this Appendix:—

(1) Test kit, Graviner, T1520 (A.P. 4343S, Vol. 1, Bk. 3, Sect. 17, Chap. 6).

(2) Insulation resistance tester Type C, 250V, Ref. No. 5G/1520.

TEST PROCEDURE

3. (1) Ensure 115V, 400c/s supply is OFF and remains OFF, switch A.C.1.

(2) Ensure 'BC/TRIGGER' switch is at its mid position.

(3) Ensure 'L' control is fully counter-clockwise.

(4) Set 'BU/EPD' switch S11 to 'BU'.

(5) Set '300–600–BU' switch S8 to BU.

(6) Connect booster unit under test to 'BU' table socket, SKT4.

(7) Set 'OV' control fully counter-clockwise.

(8) Set 'BC/TRIGGER' switch to 'BC'.

(9) Depress and hold 'OV' switch, S9.

(10) Advance 'OV' control to read 30 volts on M1, lamp volts meter, and observe that M2, 300V/600V meter, reads between 95V and 135V.

(11) Leave 'OV' control set.

(12) Release 'OV' switch, upon which M2 (300V/600V meter) indication will commence falling. Set 'BC/TRIGGER' switch to 'TRIGGER' and upon M2 (300V/600V) meter reading falling to not less than 95 volts, depress 'OV' switch smartly. 'D' lamp to show.

(13) Repeat (8) to (12) at 18V on M1, lamp volts meter.

(14) Finally, determine that the time of fall from 95V to 35V is not less than 15 seconds.

(15) On completion, return 'OV' control fully counter-clockwise and 'BC/TRIGGER' switch to its mid position.

Insulation resistance test

4. Measure the insulation resistance between each pin and the case, using a 250V insulation resistance tester Type C, the reading obtained should be not less than 20 megohms.

5. Units which fail any of the above tests should be returned for repair in accordance with the current authorized procedure.

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