Cancelled - obsolete

Chapter 32

VOLTAGE REGULATOR, TYPE 13

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Voltage regulator, Type 13	*Stores Ref. 5UC/537*
Controlled voltage	*22 volts ± 0·8 volts*
Carbon pile	*Stores Ref. 5UC/2164*
Diverter resistor	*6 ohms, 25-30 watts*
Coil current	*0·25 amp.*

Introduction

1. The voltage regulator, Type 13, is used to control the voltage supply to power units for special aircraft equipment. With an input varying between 24 and 32 volts d.c., the output is controlled at 22 ±0·8 volts.

2. General information on the construction and principle of operation of d.c. carbon pile regulators is given in A.P.4343, Vol. 1, Sect. 6, Chap. 1, to which reference should be made.

DESCRIPTION

3. The voltage regulator, Type 13, is of the series carbon pile type, where the pile is connected in series with the input and the operating coil across the output. A general view is given in fig. 1, and the internal connections in fig. 2.

4. The regulator unit is mounted on a metal base, to which two end brackets are attached for fixing. Beneath the base are housed a

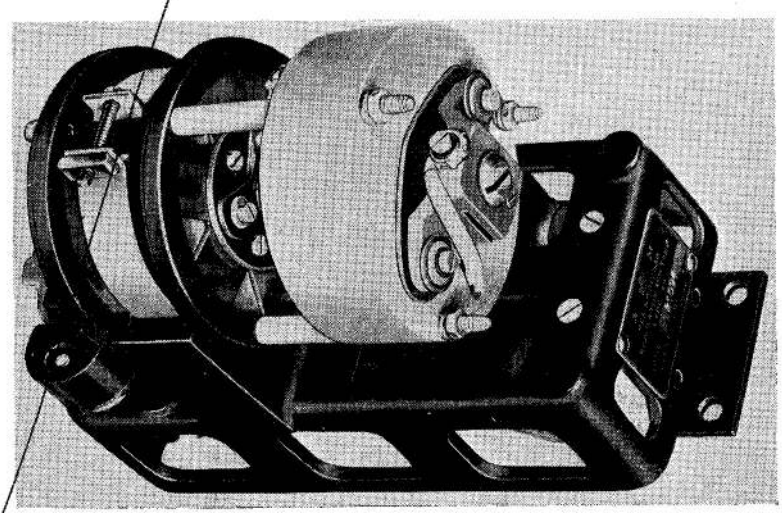

Fig. 1. Voltage regulator, Type 13

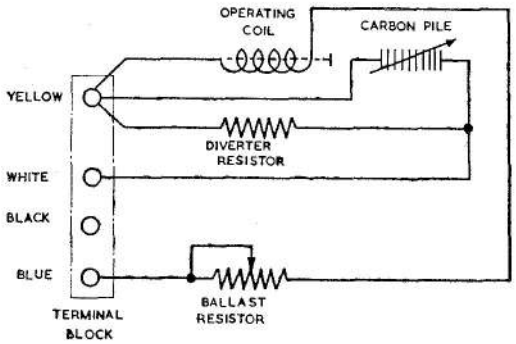

Fig. 2. Circuit diagram

variable ballast resistor in series with the operating coil, and a 6-ohm, 25–30 watt diverter resistor, which is connected across the pile to allow possible power dissipation in excess of that of the carbon pile. The pile incorporates nine 1 mm. washers and ten 3 mm. washers alternately interleaved.

SERVICING

5. General servicing instructions for this type of regulator are given in A.P.4343, Vol. 1, Sect. 6, Chap. 1. That chapter describes the fitting of a new pile stack, and the method of adjusting a regulator which is out of order. If any adjustment is made, the regulator must be fully tested for regulation and stability.

Adjustment of regulator

6. Connect the regulator in the test circuit shown in fig. 3, and to a supply which can be varied between 24 and 32 volts. Set the magnet core in the flush position as described in A.P.4343, Vol. 1, Sect. 6, Chap. 1, then adjust the pile compression screw until the dip position is reached. Lock the compression screw in this position, then adjust the voltage by means of the magnet core and check for regulation and stability as follows.

Regulation test

7. Reduce the input supply voltage to 24 volts, increase it to 32 volts, then reduce once more to 24 volts. The regulated voltage, measured by V2, should be maintained between the limits of 21·2 and 22·8 volts, the load resistor R2 being adjusted so that at 22 volts the current measured by A2 is 3 amp., and R3 set so that the current measured on A3 is approximately 0·25 amp. under operating conditions.

Stability test

8. To check the stability of the regulator, switch a supply voltage of 28 volts on and off three times. The regulator should respond without any tendency to hunt.

9. Immediately following the above test, the pile compression screw is to be slackened $\frac{1}{8}$th turn, and the test given in para. 8 repeated. There must again be no sustained hunting.

10. Provided the regulator satisfies the test in para. 9, the compression screw is to be returned to its original setting, and the regulation test in para. 7 repeated.

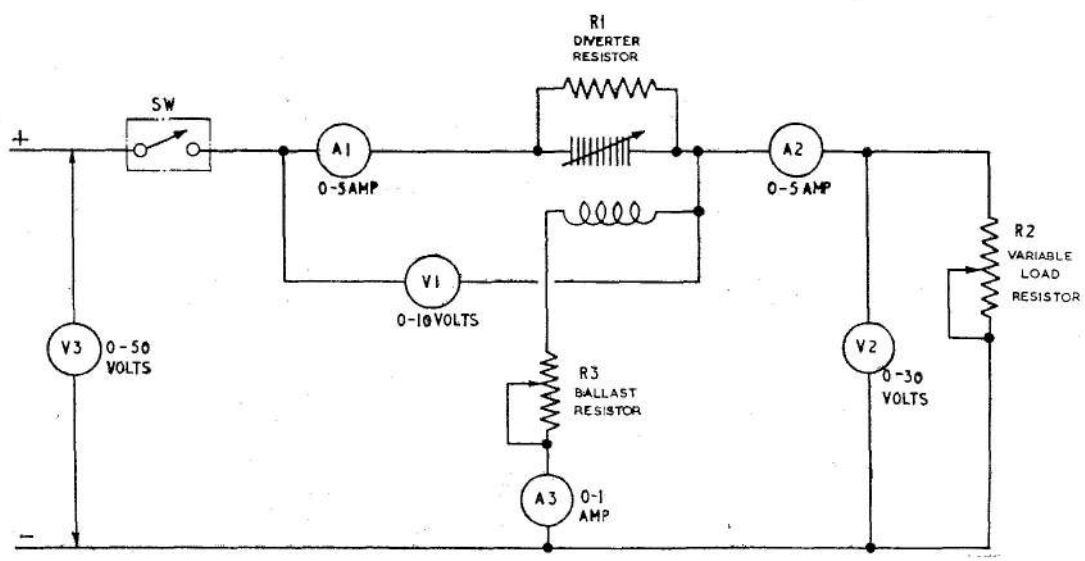

Fig. 3. Test circuit diagram