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Chapter 11

REGULATOR UNIT, ROTAX, TYPE ZA6405/1

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Regulator unit, Rotax, Type ZA6405/1 ... *Ref. No. 5UC/7100*

Control voltages—

M.V.	112 *volts d.c.*
L.V.	28 *volts d.c.*

Resistor values—

M.V. control coil (*RV*3)	90 *ohms*
L.V. control coil (*RV*11)	60 *ohms*
Ballast (*R*12)	200 *ohms*

Regulators—

*M.V., Type F*5504 (*X*1)	*Newton Type* 4/53405*E or Type* 4/60136 (*Ref. No. 5UC*/6562)
*L.V., Type F*4603 (*X*2)	*Newton Type* 37/59491 (*Ref. No. 5UC*/6563)

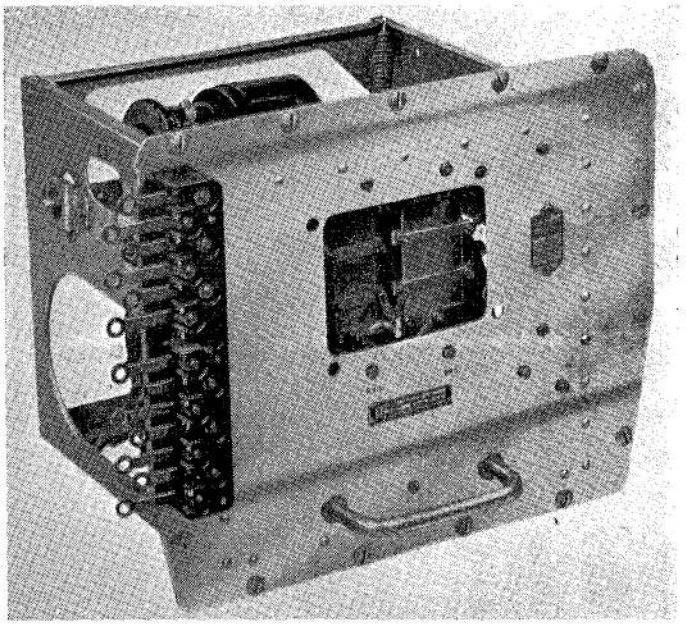

Fig. 1. General view of Type ZA6405/1 regulator unit

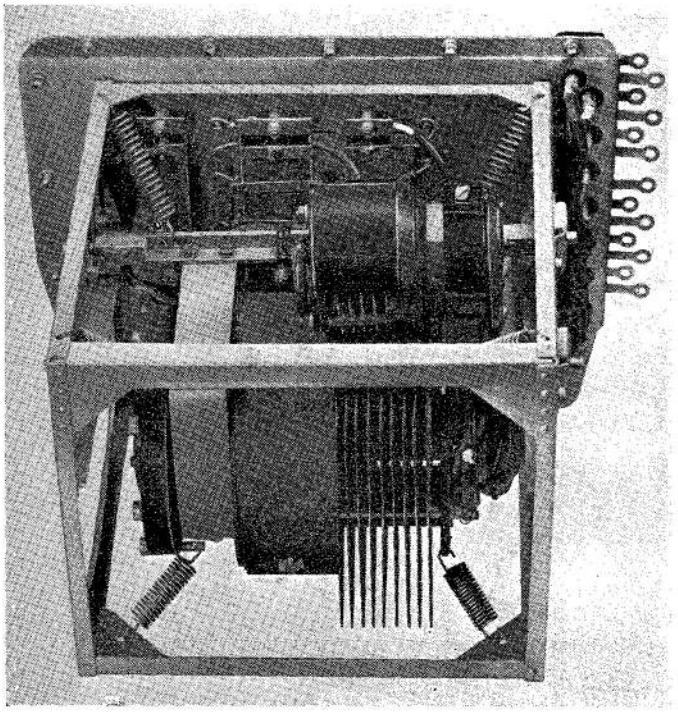

Fig. 2. Rear view of unit

Introduction

1. The ZA6405/1 regulator unit is part of the U3102 transformer rectifier unit, but despatched as a separate item for transport purposes only, and subsequently fitted to the transformer rectifier unit prior to installation in the aircraft.

2. The regulator unit provides control for the generator voltage input to the transformer rectifier unit and maintains the d.c. output for the 28-volt L.V. and 112-volt M.V. circuits to the bus-bar respectively.

DESCRIPTION

3. The ZA6405/1 regulator unit comprises one M.V. regulator (F5504), one L.V. regulator (F4603), and three resistors, RV3, RV11 and R12, contained within a main panel and chassis assembly. The resistors are fitted on the inside face of the panel and supported by mounting pillars secured with captive screws and nuts. An aperture is provided in the main panel to service the resistors, with a quick release inspection cover fitted.

4. The two regulators are anti-vibration mounted on two angle supports, whereby eight tension springs keep the complete regulator and support bar assembly in full suspension, within the chassis framework. Rubber stops are mounted at each end of the chassis framework, to control the movement of the suspended support bar assembly.

5. The main terminal block of the ZA6405/1 unit has connecting links fitted, for positive terminal connection to the associated terminal block, this being mounted on the frame of the U3102 transformer rectifier unit.

Operation

6. The generator a.c. supply to the L.V. and M.V. rectifiers is applied to the 28-volt and 112-volt d.c. bus-bars via transformers TR2 and TR5 for L.V. rectification, and via TR1 and TR4 for M.V. rectification and subsequent d.c. output supply.

7. The sequence of events which takes place is, that when the generator stator voltage drops, the bus-bar voltage also drops, thus a voltage drop occurs at the control coil of the regulator F5504. The carbon pile of the regulator will compress due to this drop in voltage, resulting in an increase in the generator rotor field current. Thus the generator voltage rises due to this increase in current, with a consequent return to nominal value of 112 volts d.c. on the bus-bar.

8. An increase in bus-bar voltage increases the resistance of the carbon pile regulator, with a consequent reduction of current to the

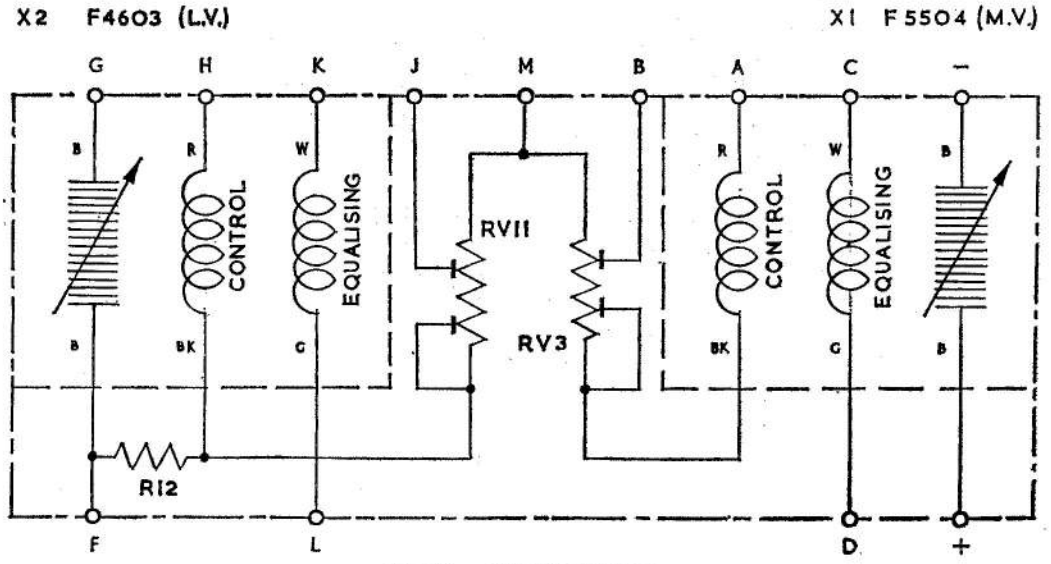

Fig. 3. Circuit diagram

generator field current, which in turn will reduce the bus-bar voltage to its nominal value.

9. The function of the regulator unit ZA6405/1 is two-fold—

(1) The F5504 regulator controls the generator field current, and in turn maintains the 112-volt supply to the d.c. busbar.

(2) The F4603 regulator controls the transductor TD1 saturation current, to maintain the L.V. bus-bar at 28 volts d.c.

For more detailed information on the operation of the regulator in conjunction with the complete system, reference should be made to A.P.4343, Vol. 1, Sect. 2, Chap. 7.

INSTALLATION

10. The regulator unit ZA6405/1 is specially packed and despatched separately from the manufacturer as a transport precautionary measure; the unit is subsequently mounted in the U3102 transformer rectifier unit, prior to installation in the aircraft.

11. The following procedure is recommended for mounting the regulator unit to the U3102 T.R.U.

(1) Remove the two tie-bars from the regulator transport formers at each end of the regulator.

(2) Remove the two clamping formers from the regulator; care should be taken in the removal of the formers from the framework, to ensure that the regulator and cable form are not disturbed on their mountings.

(3) After removal of the transport items finally check the regulator spring suspension for freedom of movement, also the electrical connections of the cable form for any possible damage or loose connections on the underside of the terminal block.

(4) Release the six captive nuts and remove the terminal block cover.

(5) Mount the regulator unit in the frame of the U3102 transformer rectifier unit, and carefully fit the terminal connecting links to the 2 B.A. studs integral with the associated terminal block.

(6) Tighten the fourteen quick release fasteners on the regulator panel and secure the regulator unit in the frame of the transformer rectifier unit.

(7) Finally secure the connecting links to the mating terminal block 2 B.A. studs with the associated locking washers and nuts.

(8) Replace the terminal block cover and tighten the six captive nuts to the securing screws on the terminal block.

Electrical connections

12. Electrical connection between the ZA6405/1 regulator unit and the U3102 transformer rectifier unit is by 13 connecting links that bridge the 2 B.A. studs fitted to both terminal block assemblies.

SERVICING

13. Make a visual check of the unit to ensure that it has not sustained any physical damage. Remove the terminal block cover from the double terminal blocks, and examine the mouldings for signs of cracks or distortion; renew any terminal block if its condition is unsatisfactory.

14. Check that the electrical connections are clean and secure, and that there are no signs of corrosion. Remove the nuts securing the connecting links to terminals +, —, and A to M on the terminal block at the lower end of the main frame on the transformer rectifier unit, and unscrew the fourteen quick release fasteners which hold the regulator unit assembly in position.

15. The regulator unit which is mounted on its own chassis may then be withdrawn from the U3102 transformer rectifier unit.

16. Make a visual examination of the internal components to ensure that there are no signs of damage or chafed leads, and that electrical connections are secure.

17. Examine the regulators for security of mounting on the two angle supports, paying particular attention to the suspension springs; faulty springs should be renewed. Check the rubber stops mounted at each end of the chassis framework for distortion and renew if faulty.

18. If during servicing it is found necessary to check or adjust the regulator ballast resistors RV3, RV11, or R12, the resistors should be set to the following values:—

(1) RV3.

Between the looped end of resistor and terminal M, 50 ± 2 ohms.

Between terminal B and terminal M 13 ± 1 ohms.

(2) RV11.

Between terminal J and terminal M 12 ± 1 ohms.

Between looped end of resistor and terminal M 40 ± 2 ohms.

(3) R12.

Between terminal H and terminal F 193 to 237 ohms.

Insulation resistance test

19. The insulation resistance should be measured between the following points, with a 250 volt insulation resistance tester; the reading should not be less than 5 megohms.

(1) Terminals +, C, K and M bonded together and the frame.

(2) Terminal + and terminals C, K and M.

(3) Terminal C and terminals K and M.

(4) Terminal K and terminal M.

Note . . .

Further tests on the individual regulators will be found in separate chapters in this book.

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