

Obsolete

### Chapter 5

## GENERATOR, TYPE V

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### LEADING PARTICULARS

Generator, Type V ... ..	...	...	...	...	Stores Ref. 5UA/350
Output voltage ... ..	...	...	...	...	80V, a.c.
Output current ... ..	...	...	...	...	15 amp.
Excitation voltage ... ..	...	...	...	...	24V, d.c.
Field resistance ... ..	...	...	...	...	7.5 ohm.
Rotation ... ..	...	...	...	...	Clockwise or anti-clockwise
Max. speed (continuous) ... ..	...	...	...	...	4,000 r.p.m.
Frequency at 3,000 r.p.m. ... ..	...	...	...	...	1,500 c/s
Weight ... ..	...	...	...	...	41 lb.

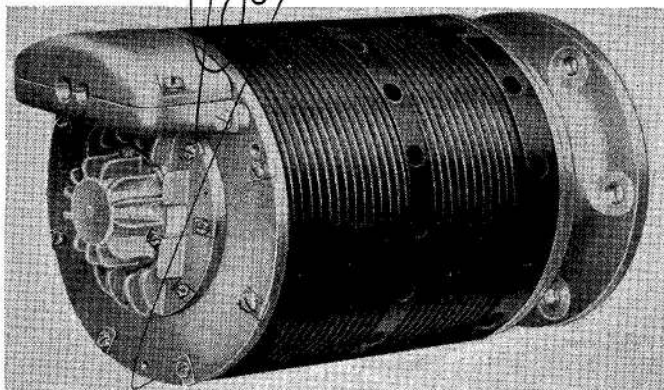


Fig. 1. Generator, Type V

### Introduction

1. The a.c. generator Type V (fig. 1) has been designed to give a maximum output of 15 amp. at 80V, a.c. when excited from the aircraft's 24V, d.c. system. Normally the output voltage of this generator is controlled by a control panel Type 5 with which is incorporated a voltage regulator Type EU, or the control panel Type 5A incorporating the voltage regulator Type EU2. A full description of these two control panels is given in A.P.4343B, Vol. 1, Sect. 7, Chap. 3 and 4

respectively. In order that the full rated output may be obtained over the full speed range, a capacitor of  $18\mu\text{F}$  must be connected in series with the a.c. winding. Allowance is made for this within the control panels.

2. The generator is intended to be engine driven through gearing and is designed to run at available speeds up to 4,000 r.p.m. continuous maximum. For periods not exceeding five minutes the maximum speed can be 5,000 r.p.m. At a speed of 3,000 r.p.m. the frequency of the output is 1,500 c/s.

#### PRINCIPLE OF OPERATION

3. The generator is of the homopolar type, the principle of operation of which is exactly as for the generator Type U, fully described in A.P.4343A, Vol. 1, Sect. 2, Chap. 3.

#### DESCRIPTION

##### General

4. Fig. 1 shows a general view of the generator, a partly dismantled view is given in fig. 2.

5. The generator, Type V, is similar in construction to the generator Type U (A.P.4343A, Vol. 1, Sect. 2, Chap. 3) except at the driving end. Here a flexible coupling contained in a special housing is incorporated in the drive. The driving end of the yoke is drilled and tapped with twelve holes, six of which take the plate mounting of the flexible couple and bearing and the other six the final engine mounting flange.

##### Flexible coupling

6. The coupling (fig. 2) consists of an internally splined plate fitting on the rotor splines and locked with a nut and washer. Over driving pegs in this plate fits a cast coupling with an external driving spline and also having locations for eight special rubber bushes. The bushes are held in position by a thrust washer and circlip. By means of the bushes and driving pegs the drive is carried through from the external driving spline to the rotor shaft and they assist in smoothing out torsional vibrations.

##### Terminals

7. The terminal connections are shown in fig. 3. The a.c. winding is connected to the two outer terminals marked with a yellow and blue spot respectively. The exciting winding is connected to the two middle terminals marked with a white and a black spot respectively.

##### INSTALLATION

8. The generator is secured to the main engine by six bolts passing through the mounting flange and should be so arranged that the terminal cover is easily accessible.

##### SERVICING

9. Very little servicing need be done to the generator apart from lubricating the bearings. An inspection should be made to see that all electrical connections are tight and free from corrosion, and all mechanical fixings are secure.

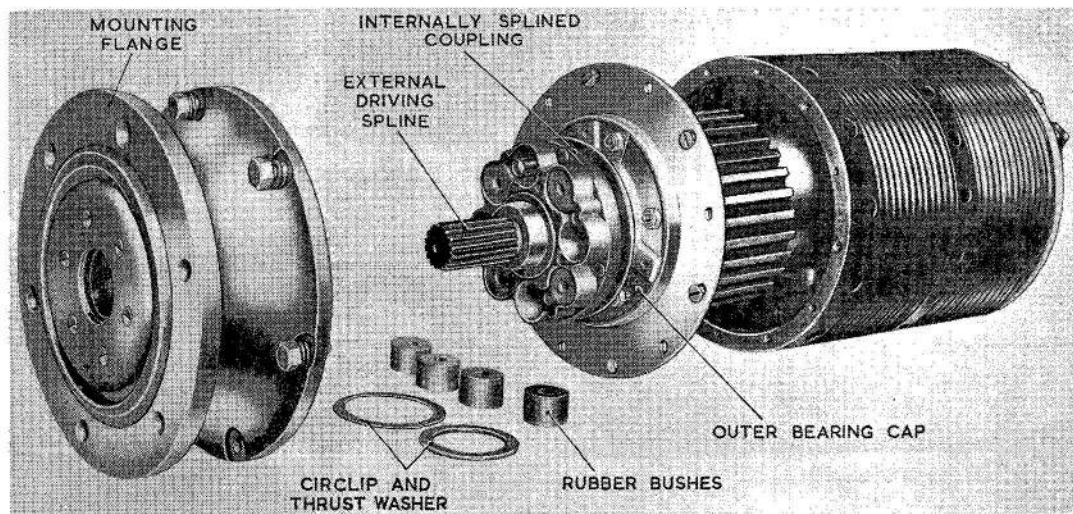


Fig. 2. Partly dismantled view

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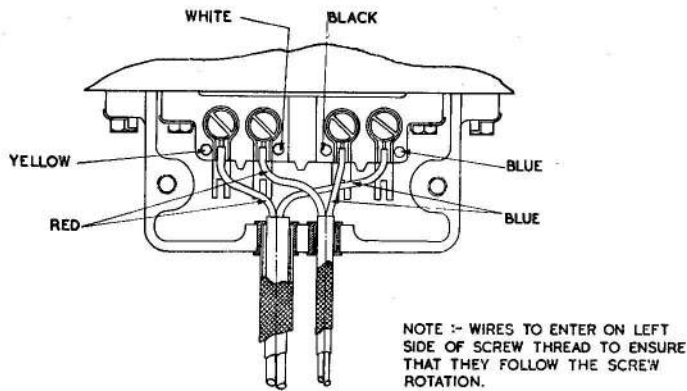


Fig. 3. Terminal connections

**Lubrication**

**10.** To lubricate the bearings it is necessary to remove the generator from the aircraft and proceed as follows. At the drive-end remove the six hexagonal-headed bolts holding the mounting flange and then remove the flange. Take out the circlip and thrust washer securing the external splined coupling. Prise out four alternate rubber bushes thus ensuring easy removal of the external splined coupling. Take off the nut and washer securing the internal splined coupling and slide the latter carefully off.

**11.** The bearing housing is now accessible. Remove the outer bearing cap and Vellumoid gasket by taking off the six nuts. Well soak the felt of the outer bearing cap in lubricating oil (OM-170). After soaking and replacing the felt in the bearing cap, lightly depress the felt with the fingers to exude superfluous oil and wipe the metal part free from oil with a soft rag. Re-fit the outer bearing cap and the Vellumoid gasket to the driving end, replace the nuts securely and lock the tab washers. When assembling the flexible drive the four alternate rubber bushes must be inserted after the external splined coupling has been replaced. Examine all rubber bushes for serviceability and renew if necessary. Smear a little oil on the splined shaft of the generator before refitting the

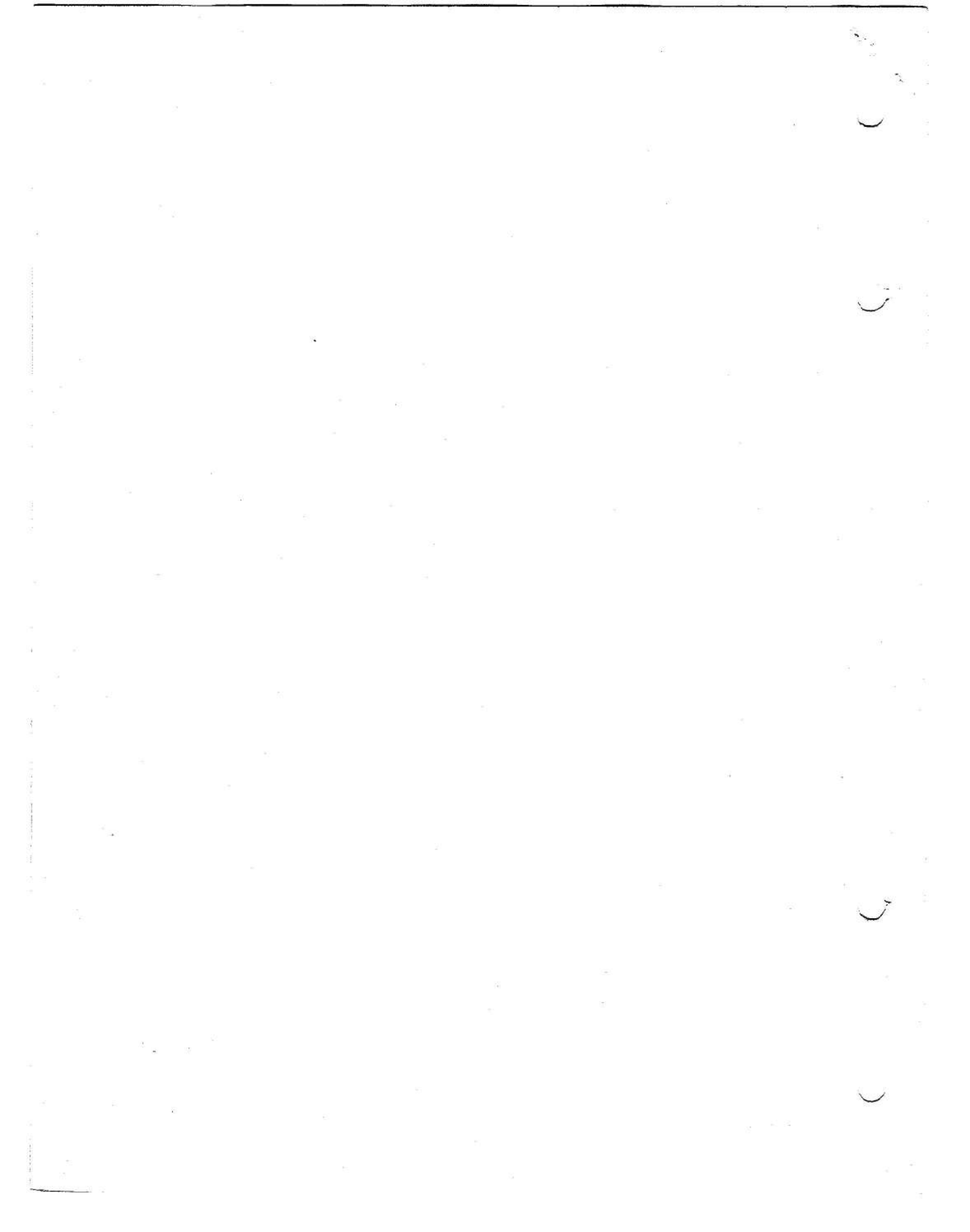
internal splined coupling and place one or two drops of oil in the bronze brush of the external splined coupling before assembling. Replace the circlip holding the rubber bushes and the bronze thrust washer in place. The felt washer in the outer side of the support ring should be checked for serviceability and replaced if necessary. This felt should be free of oil, its function being to prevent ingress of foreign matter to the flexible coupling.

**12.** At the non-drive end take out the screws holding the outer bearing cap and remove the latter. This frees two Vellumoid gaskets and a felt wiping washer and retaining disc. Soak the outer bearing cap and the felt wiping washer in lubricating oil. After soaking shake and wipe off surplus oil from the metal parts. Re-fit the components in the following order ; Vellumoid gasket, felt wiping washer and retaining disc (felt AWAY from the bearing), Vellumoid gasket and finally the outer bearing cap. Fit and secure the three fixing screws and lock the tab washers.

**TESTING**

**13.** A check should be made to see that the rotor revolves freely, without excessive noise or end play in the bearings.

**14.** The generator should be connected to its appropriate control panel, this latter being connected to a suitable source of d.c. supply and to a suitable load. Switchboard Type K (*Stores Ref. 5G/214*), and loading panel (*Stores Ref. 5G/215*), are available for this purpose. The generator should then be run at approximately 4,000 r.p.m. with an output current of 15 amp. for a period of 20 minutes. At the end of this period the insulation resistance of all live parts together to the frame should be not less than .05 megohms when measured with a 250V insulation tester.



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