Chapter 2

GENERATOR AND FLYWHEEL ASSEMBLY, E31044

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

	Ref. No.
Generator and flywheel assembly, port, E31044	27G/3010
Generator	27G/3017

Introduction

1. The two generator and flywheel assemblies E31025 and E31040 form part of the Goodyear anti-skid system, the function of which is to prevent the skidding of aircraft wheels on landing. The assemblies are attached to the aircraft main-wheels, one to the port wheel and one to the starboard wheel. The flywheel is rotated by the main wheel and transmits the rotation to the generator. The generator, thus monitors the speed of the main wheels and feeds a voltage into a control box. From the generator output the control box is able to detect when a skid is imminent and operates to energize a solenoid valve and release the hydraulic pressure to the wheel brake. For details of the control box refer to Chapter 1 of this Section, and for details of the solenoid valve refer to A.P.1803A, Vol. 1, Sect. 9.

DESCRIPTION

2. The assembly comprises a small d.c. generator mounted in a case, and driven via the flywheel assembly (*fig.* 1). A bracket attached to the case forms the mounting of the assembly to the aircraft.

3. The generator is secured within a case by means of four screws (*fig.* 2), and the connections brought out on a Cannon plug. A rubber bonded flywheel assembly with its bearing is located at the generator driving end of the case, and is secured to the case by a bearing nut. A flywheel cap at the driving end mates with the spade drive of the generator (*fig.* 2), and is screwed to the flywheel assembly forming the positive drive to the

generator via the flywheel. A mounting bracket attached to the case by a pivot bolt is spring-loaded, so that when the assembly is mounted on the aircraft and the pip pin (*fig.* 3) is correctly located, the flywheel is spring-loaded on to the track ring drive of the mainwheel. The generator has a permanent magnet field and is completely enclosed in a sealed case.

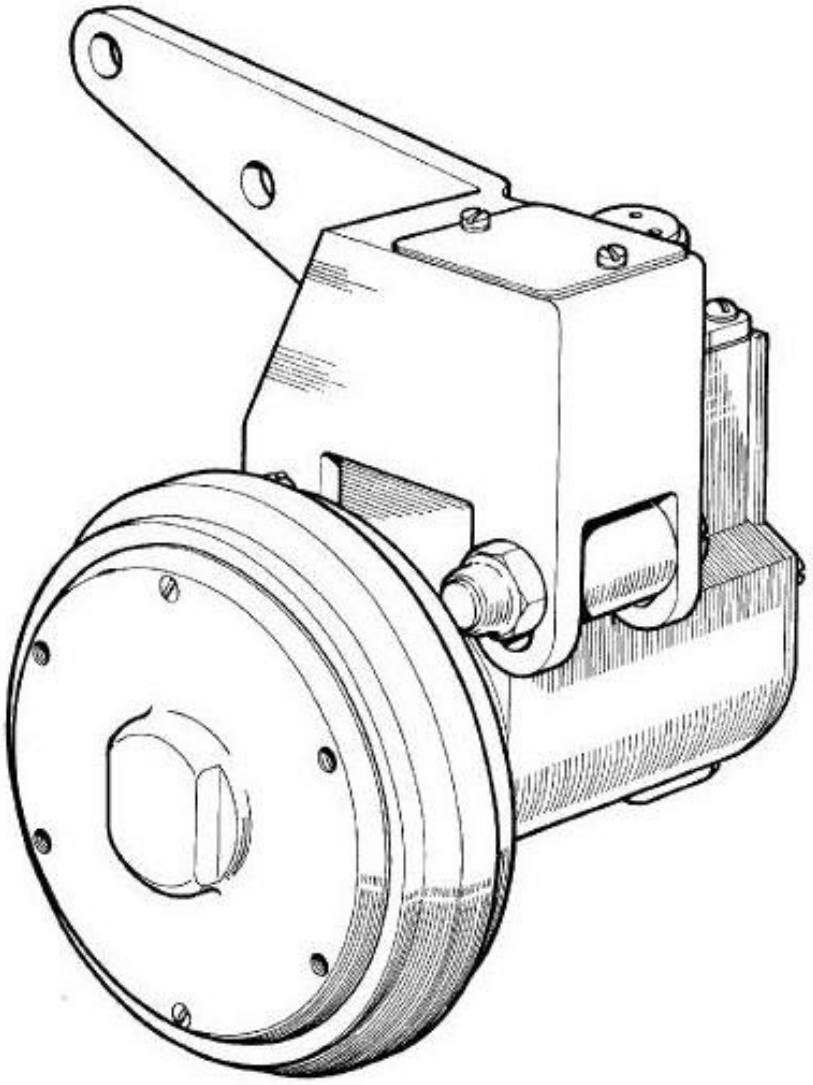

Fig. 1 Generator and flywheel assembly

4. When the mainwheel of the aircraft is static, the rubber bonded flywheel is in contact with the track ring drive of the mainwheel. When the wheel revolves the flywheel is rotated and drives the generator via its spade drive, the generator output voltage being fed to the control box via the Cannon plug.

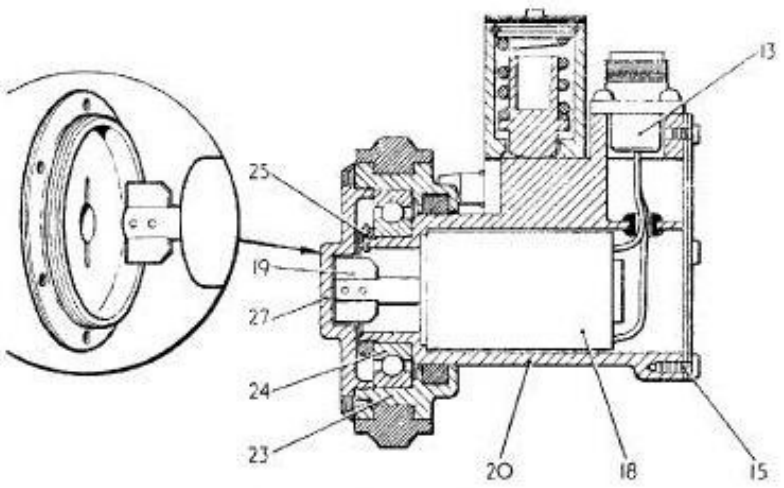

Fig. 2 Sectioned view

SERVICING

5. Examine the assembly externally for damage, corrosion and security of attachment. Ensure that the flywheel spins freely. For futher examination of the unit dismantle as detailed below:—

Dismantling (*fig.* 3)

6. (1) Unscrew the two lock screws (28) and remove the flywheel cap (27) with its seal (26).

(2) Remove the split pin (29) and remove the bearing nut (25), the flywheel assembly (23) and bearing (24) from the case (20).

(3) Remove the felt dust excluder (22) from the flywheel (23) and discard the dust excluder (22).

(4) Unscrew the four screws and lockwashers (15) and remove the generator plate (16) and its seal (17).

(5) Disconnect the two leads of the generator from the Cannon plug (13).

(6) Remove the four generator locating screws (21) and withdraw the generator (18) from its case (20).

(7) Remove the rubber grommet (14).

(8) Remove the pip pin (9), unscrew Nyloc nut (31) and remove pivot bolt (10).

(9) Remove the two screws (1) with their lockwashers (2) and remove the plate (3), and the seal (4), from the mounting bracket (32).

(10) Remove the circlip (5), spring backing plate (6), spring (7) and the spring button (8).

(11) Remove screws (11), washers (12) and extract Cannon plug (13) from case (20), discarding the seal (30).

Examination

7. (1) The generator case and mounting bracket should be inspected for damage and distortion, the pip pin for correct operation and alignment with the mounting bracket. Check the pivot bolt for wear and distortion, and condition of threads.

(2) Examine the rubber bonded flywheel for wear and distortion. The flywheel bearing should be cleaned and examined for damage, pitting and blueing.

(3) The spring should be subjected to a testing load of 30 lb, the length of spring should then be between 0·800 in. and 0·875 in. If the spring length is outside these limits, renew the spring.

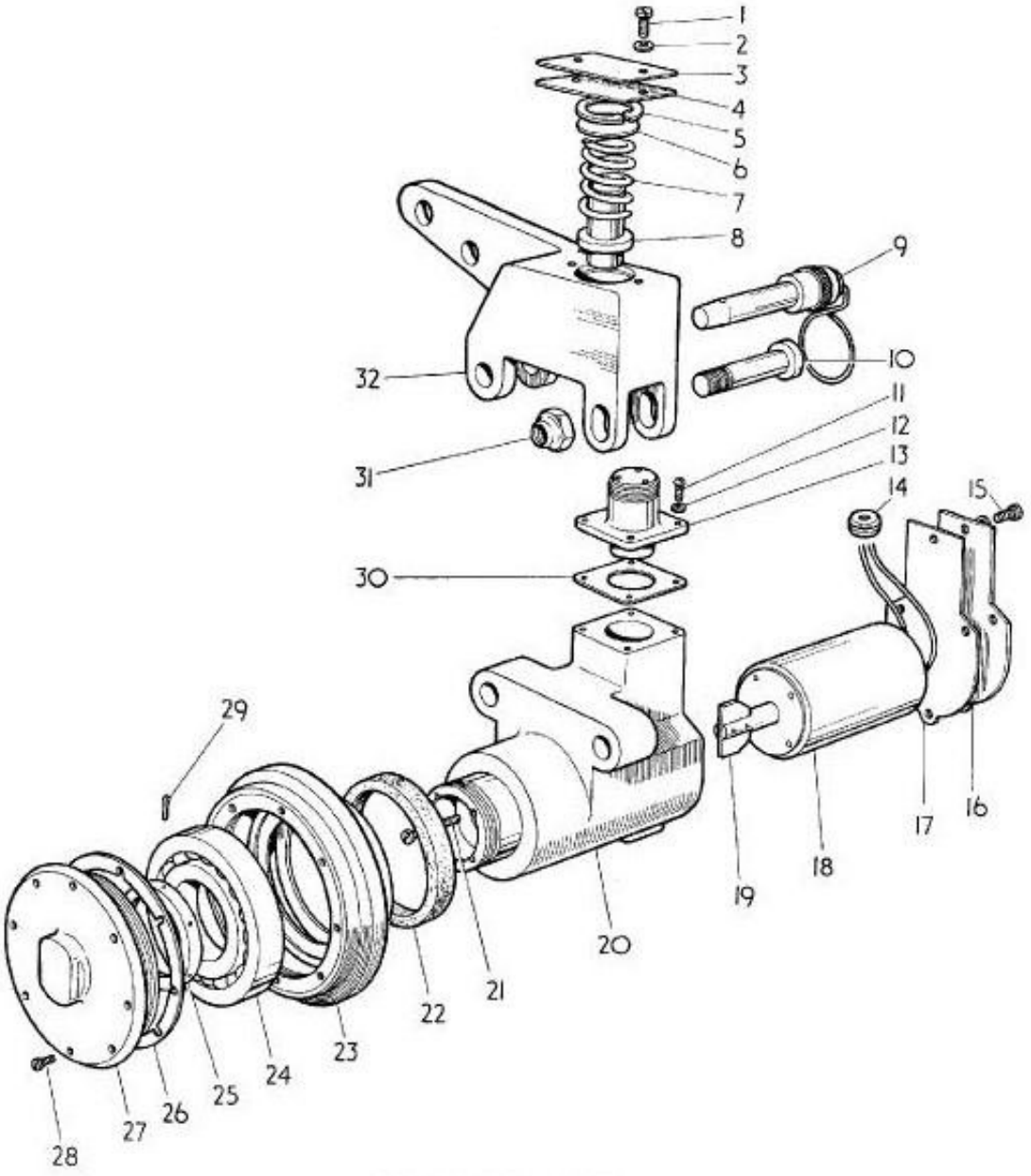

Fig. 3 Exploded view

Key to Fig. 2 and 3

1 SCREW
2 WASHER
3 PLATE
4 SEAL
5 CIRCLIP
6 SPRING BACKING PLATE
7 SPRING
8 SPRING BUTTON
9 PIP PIN
10 PIVOT BOLT
11 SCREW
12 WASHER
13 CANNON PLUG
14 GROMMET
15 SCREW
16 GENERATOR PLATE
17 GENERATOR SEAL
18 GENERATOR
19 SPEED DRIVE
20 GENERATOR CASE
21 LOCATING SCREW
22 DUST EXCLUDER
23 FLYWHEEL
24 BEARING
25 BEARING NUT
26 FLYWHEEL CAP SEAL
27 FLYWHEEL CAP
28 LOCK SCREW
29 SPLIT PIN (BEARING NUT)
30 CANNON PLUG SEAL
31 NYLOC NUT
32 MOUNTING BRACKET

(4) Examine the generator and the generator spade drive for damage, distortion, security of rivets, and deterioration of the lead insulation. The generator cannot be dismantled for examination and its serviceability should be assessed from external examination, functional testing and operational time. At the specified periods the generator should be renewed.

Assembling

8. (1) Fit the spring button (8), the spring (7), the spring backing plate (6), and insert the circlip (5) in the mounting bracket (32).

(2) Fit the seal (4) and the plate (3), and secure with the two screws (1) and lockwashers (2).

(3) Place the rubber grommet (14) in position over the generator leads.

(4) Locate the generator (18) in the case (20) and secure with the four generator locating screws (21), apply LOCTITE GRADE C (33H/176) to the threads of the screws; centre pop lock the screws.

(5) Connect the two generator leads to the Cannon plug (13), black wire to pin B and red wire to pin A.

(6) Fit the generator plate seal (17), the plate (16) and secure with the four screws and lockwashers (15).

(7) Fit a new dust excluder (22), after first soaking in oil OM–12 and then squeezing out by hand. Pack the bearing (24) with grease XG–277, and fit both bearing and dust excluder seal to the flywheel. Assemble the flywheel assembly to the generator case (20) and secure with the bearing nut (25), locking with a new split pin (29).

(8) Attach the seal (26) to the flywheel cap (27) by means of pliogrip non-setting adhesive and screw on to the case. Secure with the two lockscrews (28).

(9) Fit mounting bracket (32) to case and secure with pivot bolt (10) and Nyloc nut (31).

Note . . .

It is advisable not to fit the pip pin (9) *to the case if the unit is being held in stores, in order that the return spring* (7) *may be left free.*

Testing

9. The equipment required to functionally test the generator is as follows:—

(1) A variable speed drive motor capable of speeds up to 5,000 r.p.m. It should be possible to determine r.p.m. values to within $\pm 1{\cdot}0\%$.

(2) A voltmeter accurate to within $\pm 1{\cdot}0\%$ capable of measuring 2V d.c. to 100V d.c.

(3) Ohmmeter capable of readings up to 1,000 ohms $\pm 5{\cdot}0\%$.

(4) Cathode ray oscilloscope.

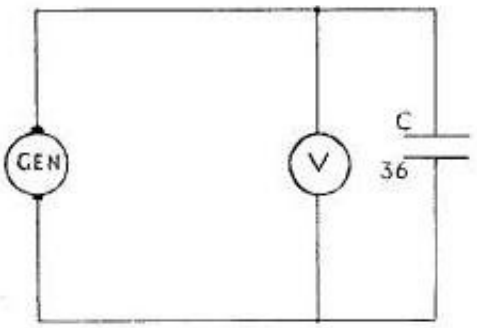

Fig. 4 Test circuit

(5) Capacitor 36 μF, 200V, see test circuit fig. 4.

Functional tests

10. (1) Check generator for correct polarity (black wire is positive when shaft is rotated clockwise as viewed from drive spade end).

(2) Check output voltage (*fig.* 4) by connecting voltmeter into the test circuit. Output should be 20V d.c. at 1000 r.p.m. and be linear within ±5% over the speed range of 100 to 5000 r.p.m.

(3) Check ripple voltage by connecting cathode ray oscilloscope into test circuit. Maximum ripple voltage is 1 volt, peak to peak over the speed range of 100 to 5000 r.p.m.

(4) Check brush to brush resistance by running the generator for one minute at 1000 r.p.m. with no load across the leads. Connect ohmmeter to the generator leads. Rotate the shaft through 90° slowly, and the brush to brush resistance should not exceed 700 ohms.