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TACHOMETER GENERATOR TYPE 2701 KGA/CP/1

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

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Ministry of Defence

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Chapter 1
DESCRIPTION AND OPERATION

Introduction

1. The tachometer generator, Type 2701 KGA/CP/1 (*Ref. No. 6A/1993616*), (*fig.* 1) is a miniature, lightweight, engine mounted generator which provides an electrical signal of a frequency proportional to the speed of rotation of the drive shaft. Used in conjunction with a suitable indicator, an indication of engine shaft speed, in terms of percentage R.P.M., is obtained.

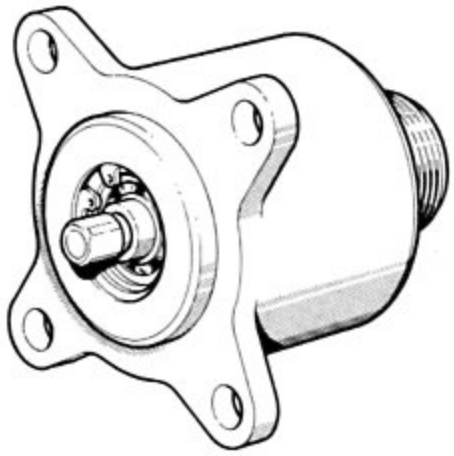

Fig. 1. Tachometer generator, Type 2701 KGA/CP/1

DESCRIPTION

2. The generator, (*fig.* 2) consists of a two-pole permanent magnet rotor supported in ball-races within a three-phase stator. The assembly is housed in a stainless steel case to which is welded a back plate carrying a three-pin electrical connector. The front of the case is formed with lugs to permit engine installation.

3. The stator consists of a laminated stalloy stack. Lead-outs from the stator windings are of P.T.F.E. insulated multi-strand wire, which terminate at the electrical connector pins. The stator is permanently secured inside the case.

4. The rotor consists of a shaft, a self-aligning drive and a permanent magnet. The self-aligning drive is incorporated in the end of the rotor shaft, and consists of a number of leaf springs pinned to the rotor shaft at one end and the square drive shaft at the other. The inner pin is designed to shear at a value of driving torque of 35 lb.f.in. to 45 lb.f.in. The rotor is supported by front and rear ball races housed in the case and back plate.

5. Lubrication is provided by the aircraft engine oil, which circulates through the generator front bearing. Leakage of oil is prevented by an 'O' ring at the joint faces.

OPERATION

6. When the permanent magnet rotor revolves inside the stator coil, a three-phase voltage is induced in the stator windings. The frequency of this voltage is directly related to the speed of the rotor magnet and is therefore proportional to engine speed. The generator output voltage is applied to a synchronous motor contained in a remote tachometer indicator. The synchronous motor drives a tachometric unit which enables an indication of engine speed to be obtained.

INSTALLATION

7. The phase sequence is A, B, C when the drive shaft is driven in a clockwise direction, as viewed on to the drive shaft end. The electrical connector fitted to the unit is a Cannon hermetically sealed plug GS02-14S-7P-111. The square ended drive shaft is 0·244 in. across the flats. After connection to the tachometer indicator, it is advisable at the next engine run to turn the engine over at a slow speed to ensure that the phase sequence is correct.

SERVICING

8. Prior to installation, or at any time when the serviceability of the generator is suspect, it should be subjected to the standard serviceability tests detailed in Chapter 2.

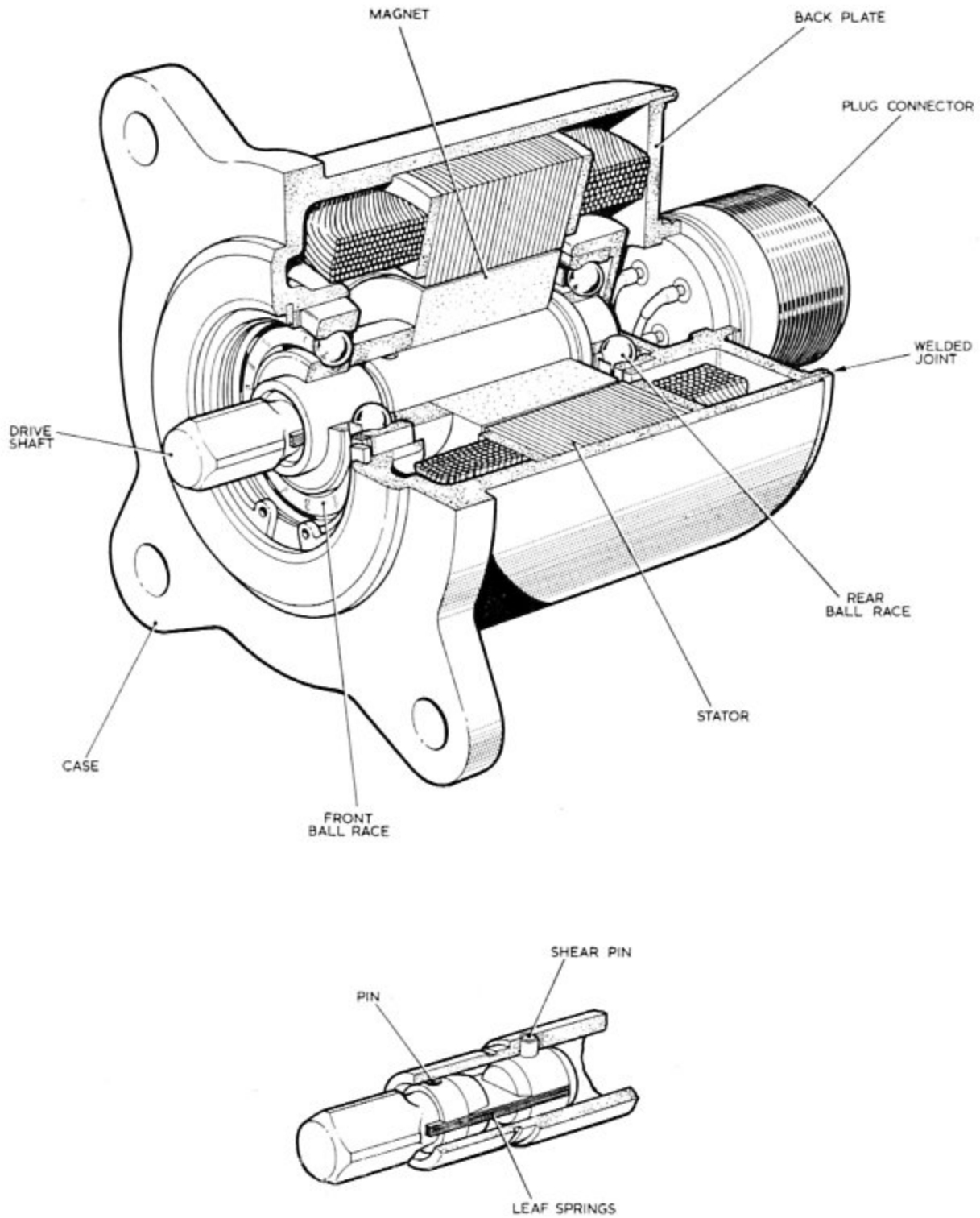

Fig. 2. Tachometer generator, sectional view

Chapter 2

STANDARD SERVICEABILITY TESTS
(Completely Revised)

Introduction

1 The tests detailed in this chapter are to be applied to the tachometer generator, Type 2701 KGA, prior to installation in the aircraft, or if serviceability is suspect. Any tolerances specified must not be exceeded.

Test equipment

2 The following test equipment is required:

2.1 Tester, insulation resistance, Type A 500 V (Ref.No.5G/1621)

2.2 Multimeter (Ref.No.5QP/17447)

2.3 Compatible tachometer indicator

2.4 Dual tachometer tester (Ref.No.6C/3000, 6C/2391 or 6C/2392)

TEST PROCEDURE

Insulation resistance - room temperature

3 Before the generator undergoes synchronization and ranging tests, measure the insulation resistance between pins A, B, C and the body, in turn. The resistance in each instance must not be less than 20 megohms when a potential of 500 V d.c. is applied for a period of not less than 5 seconds.

Continuity test

4 Measure the resistance between each pair of pins, in turn, and ascertain that the measured value is 35 $\pm$5 ohms between each phase, and that each reading is within 1 ohm of the other readings.

Synchronization and ranging tests

Note ...

If an oil bath adapter is not available with the test set being used, saturate the bearings of the generator with engine oil before connecting up. This saturation must be repeated for each half hour running time.

5 Turn the generator by hand and ensure that it rotates freely. Mount the generator on the tester and connect the generator to a compatible indicator. Switch on the test equipment and allow the generator and indicator to run at approximately two-thirds of the full scale range of the indicator for 10 minutes. At the end of the exercising run, slowly reduce the speed to zero.

6 To check the synchronism of the generator and indicator, start the test equipment and slowly increase the speed from zero. Check the speed at which the generator and indicator synchronize; this will be apparent by the cessation of pointer oscillation and must occur at the speed stated in the standard serviceability test applicable to the indicator.

7 Provided that the generator can be driven freely and the generator and indicator synchronize at the specified speed, the generator will not possess any inherent inaccuracies, since it is frequency and not voltage which is being measured.

Insulation resistance - hot

8 Immediately after the completion of the synchronization and ranging tests, measure the resistance between pins A, B, C and the body, in turn. In each instance the insulation resistance must not be less than 20 megohms with a potential of 500 V d.c. applied.

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