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TACHOMETER GENERATOR, Type 2601KGA/CP/1

GENERAL AND TECHNICAL INFORMATION

PARTS CATALOGUE - NAVAL

BY COMMAND OF THE DEFENCE COUNCIL

J. T. Dunnett

Ministry of Defence

FOR USE IN THE

ROYAL NAVY

ROYAL AIR FORCE

(Prepared by the Ministry of Technology)

A.L.1, June 69

AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in this publication, sign against the appropriate A.L. No. and insert the date of incorporation.

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LIST OF CHAPTERS

GENERAL AND TECHNICAL INFORMATION (-1)

Chapter 1

DESCRIPTION AND OPERATION

Introduction

1. The engine speed generator, Type 2601 KGA/CP/1 (Ref. No. 6A/11143), fig. 1, is used in conjunction with an associated indicator to provide remote indication of engine speed.

General description

2. The generator (fig. 2) consists of a three-phase stator and a two-pole permanent magnet rotor enclosed in a housing with a square mounting flange at one end and a three-pole electrical plug connector at the side of the housing. The housing comprises front and rear castings, which are bolted together at the rear.

3. The stator is permanently secured inside the front casting and the output leads are connected to three pins of the plug connector.

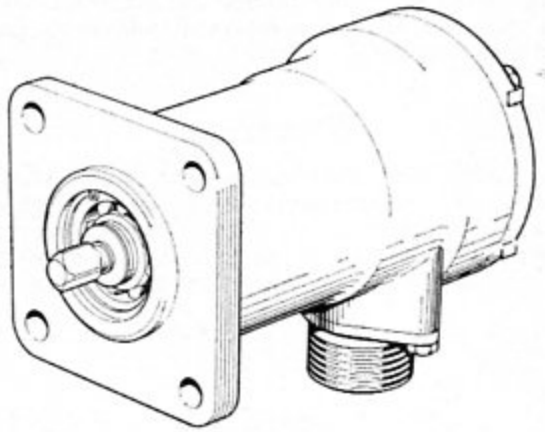

Fig. 1. General view

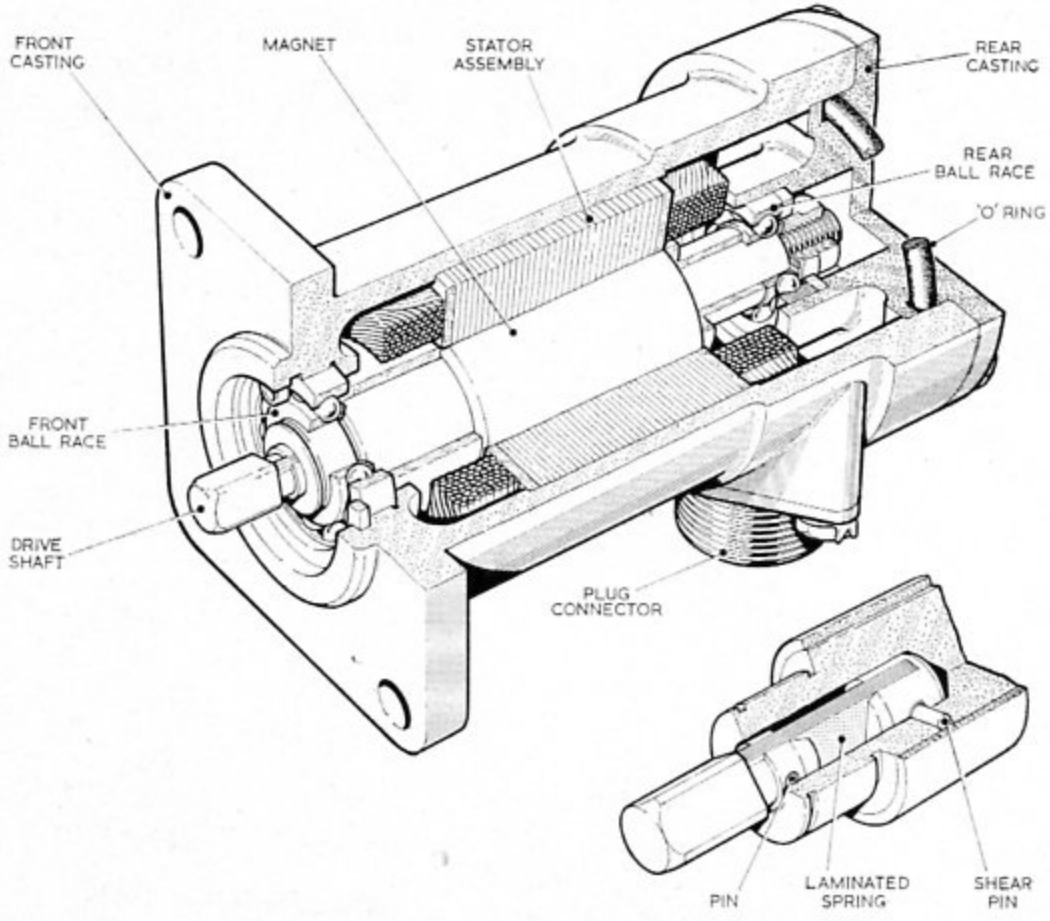

Fig. 2. Sectional view

4. The rotor shaft is supported in ball bearings, one housed in the front casting and the other in the rear casting. The shaft carries the two-pole permanent magnet, and the square-ended drive shaft is coupled to it by a laminated spring to compensate for any slight misalignment with the drive from the engine. The spring is secured at each end by a pin, the inner one being designed to shear at a value of driving torque between 35 lb in. and 45 lb in.

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 an associated tachometer indicator. The synchronous motor drives a tachometric unit which enables an indication of engine speed to be obtained.

INSTALLATION

7. The phase sequences are A, B, C or 1, 2, 3 for clockwise rotation of the drive shaft when viewed from the drive end. After connection to the tachometer indicator, it is advisable at the next engine run to turn the engine over at low speed to ensure that the indicator is reading correctly.

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.

Chapter 2

STANDARD SERVICEABILITY TESTS

Introduction

1. The tests detailed in this chapter are to be applied to the above-mentioned equipment 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:—

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

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

(3) Compatable tachometer indicator

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

(5) Tachometer tester, bench type (Ref. No. 6C/1879 or /1880) alternative to item (4).

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 500V 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 25 $\pm$ 5 ohms between each phase, and that each reading is within 2 ohms of the other readings.

Synchronization and ranging tests

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.

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.

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 synchronization 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 500V d.c.

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PARTS CATALOGUE - NAVAL (3A(N))

MAIN EQUIPMENT TACHOMETER, GENERATOR, TYPE 2601KGA/CP/1 Ref. No. 6A/11143

(1) Item No.	(2) Ref. No.	(3) Part No.	(4) 1 2 3 4 5 6 7 8 Description	(5) No. Off	(6) Remarks	(7) C of E	(8) Plate/ Cct Ref.
1	6A/11143	2601/KGA/CP/1	TACHOMETER GENERATOR	1		P	
2	6A/12481	P.13727	. COVER DRIVE	1		C	
3	6AA/7715	P.4371	. CIRCLIP INTERNAL	1		C	
4		SA.13804	. MAGNET AND SHAFT ASSEMBLY				
5	6AA/7710	P.13735	. . SLEEVE	1		C	
6	6AA/7709	P.13697	. . PIN	1		C	
7	6AA/7705	P.13693	. . SHAFT DRIVE	1		C	
8	6AA/7707	P.13695	. . SPRING DRIVE, SHAFT	1C		C	
9	6AA/7711	P.13795	. . BUSH DRIVE	1		C	
10	6AA/7706	P.13694	. . BUSHING DRIVE SHAFT	1		C	
11	6AA/7708	P.13696	. . PIN, SHEAR	1		C	
12	6AA/7704	P.13730	. . SHAFT, MAGNET	1		C	
13	5999-99-107-8441	SA.13786	. . MAGNET PERMANENT	1		C	
14	6AA/7712	P.13740	. BEARING BALL (FRONT)	1		C	
15	6AA/7716	P.13736	. PIECE DISTANCE	1		C	
16	6AA/7715	P.13739	. BEARING BALL (REAR)	1		C	
17	6AA/7720	30-273-155-11	. NUT	1		C	
18	6AA/9482	S.P.N. 158	. WASHER, SPECIAL	1		C	
19	6620-99-107-8446	KGA 1119	. END SHIELD ELECTRICAL ROT, EQUIP,	1		C	
20	5310-99-944-3620	GA 1046	. WASHER, FLAT	1		C	
21	5330-99-107-8440	30-781-1043-99	. RING, SEALING, TOROIDAL	1		C	
22	5305-99-107-8439	HE4135/E	. SCREW MACHINE	4		C	
23	5310-99-107-8442	S.P.N. 351	. WASHER, FLAT	4		C	
24	5310-99-107-8443	S.P.N. 309	. WASHER, KEY	4		C	
25	6620-99-107-8445	K.G.A. 263	. STATOR GENERATOR	1		C	

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26	5935-99-107-8444	K.G.A. 1140	. PLUG, ELECTRICAL	1		C	
27	5330-99-195-1795	30-781-214-99	. RING, SEALING, TOROIDAL	1		C	
28	5305-99-107-8447	GA.A.188	. SCREW MACHINE	2		C	
29	5310-99-120-0106	G.A. 1021	. WASHER, KEY	2		C	
30	9150-99-910-0591	OX-38	. OIL LUBRICATING	A/R		C	
31	8030-99-220-2572	GRADE 'C'	. VARNISH LOCKING (LOCTITE)	A/R		C	
32	34B/1417	SQ-32L	. JOINTING (HYLDMAR)	A/R		C	

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