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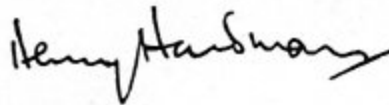
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GROUP 112: INSTRUMENT EQUIPMENT  
SUB-GROUP : GENERAL INSTRUMENTS

**TACHOMETER GENERATORS,  
TYPE KGA04 SERIES**

**GENERAL AND TECHNICAL INFORMATION**

BY COMMAND OF THE DEFENCE COUNCIL



(Ministry of Defence)

FOR USE IN THE  
NAVAL SERVICE  
ROYAL AIR FORCE

(Prepared by the Ministry of Aviation)

### AMENDMENT RECORD SHEET

Record the incorporation of an amendment list by inserting the numbers of the pages affected and the date of making the amendments, and by signing in the appropriate column.

A.L. No.	Pages affected	Date	Incorporated by
1	LIST OF CHAPTERS	4-2-70	W. Burt Sae
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### MODIFICATION RECORD

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## Chapter 1

### TACHOMETER GENERATORS, TYPE KGA04 SERIES

#### Introduction

1. The engine speed generators, Type KGA04 series (fig. 1), are driven from the aircraft engine and produce an alternating voltage which varies in frequency in relation to the engine speed. When it is used in conjunction with a suitable indicator, two of which may be operated from one generator, remote indication of the engine speed is given.

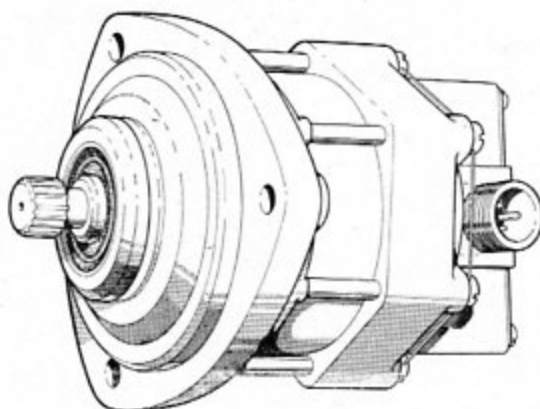


Fig. 1 General view

#### DESCRIPTION (fig. 2)

2. The generator consists of a three-phase stator, clamped between two end casings, and a two-pole permanent magnet rotor, supported at each end by a ball bearing. The rear bearing is secured to the rotor shaft and locates in the rear casing. The front bearing is located in a recess in the front casing and retained on the shaft by a circlip.
3. The rotor magnet is located on the shaft by a driving disc, which also locates with a shoulder on

the shaft. The driving disc, magnet and rear bearing are clamped together by a locknut at the rear end. The front end of the rotor shaft carries a splined drive coupling for connection to the engine. An oil seal at the drive end prevents engine oil entering the generator. The three stator leads are connected to a terminal box or a plug mounted on the rear casing.

#### OPERATION

4. The 2-pole rotor magnet is driven by the engine by direct coupling and generates a three-phase alternating voltage in the stator windings with a frequency proportional to the rotor speed. When the generator output is connected to the stator of a synchronous motor contained in an associated indicator the resulting magnetic field rotates at the same speed as the generator rotor, and the motor speed is therefore proportional to the engine speed.

#### INSTALLATION

5. The phase sequence is A, B, C at the terminals when the generator is rotated clockwise, as viewed from the splined end of the shaft. After connection to tachometer indicators it is advisable at the next engine run to check at low engine speed that the indicators are reading correctly.

#### SERVICING

6. The ball bearings are packed with grease on assembly and no routine lubrication of the generator is required.
7. Prior to installation, or at any time when the serviceability of the generator is suspect, it should be subjected to the standard serviceability test detailed in Chapter 1-1.

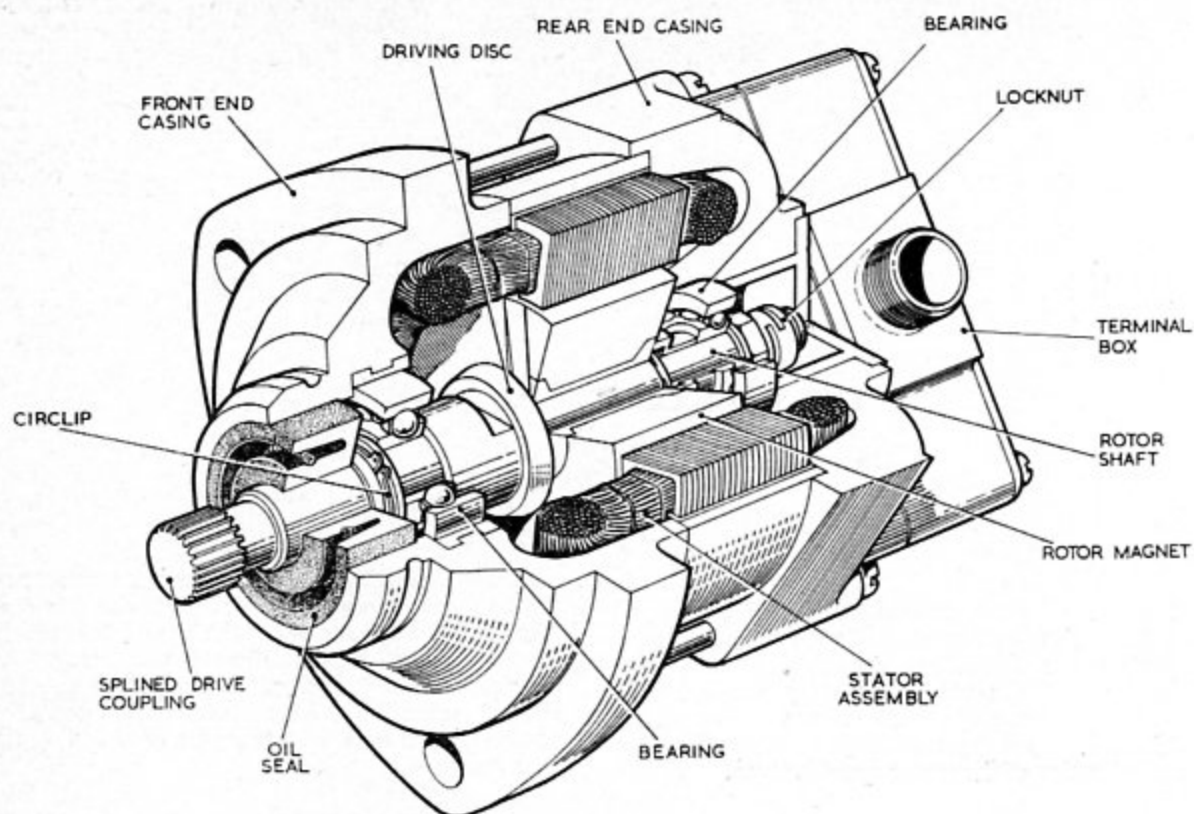


Fig. 2 Sectional view



## Chapter 1—1

## STANDARD SERVICEABILITY TESTS

### for

## TACHOMETER GENERATORS, TYPE KGA04 SERIES

**Introduction**

1. The tests detailed in this chapter are to be applied to the above-mentioned equipment immediately prior to installation in aircraft, or if serviceability is suspect. The tolerances specified are not to be exceeded.

**Test equipment**

2. The following test equipment is required:—

- (1) Tester, insulation resistance, Type C (Ref. No. 5G/152)
- (2) A serviceable compatible tachometer indicator
- (3) Dual tachometer tester (Ref. No. 6C/3000, 6C/2391 or 6C/2392)  
*alternative to item (3)*
- (4) Tachometer tester bench type (Ref. No. 6C/1879 or 6C/1880)  
*alternative to item (3)*
- (5) Tachometer calibrator, Mk. 2 (Ref. No. 6C/869)

**TEST PROCEDURE****Insulation resistance—room temperature**

3. Before the generator undergoes synchronizing and ranging tests, measure the insulation resistance between the generator case and each of the terminal

connections in turn. The resistance must be not less than 20 megohms.

**Exercising run**

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

**Synchronizing and ranging**

5. Start the test equipment and slowly increase the speed from zero until 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 being used.

6. Provided that the generator can be driven freely, and the tachometer indicator synchronizes 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**

7. After completion of the synchronizing test, measure the insulation resistance between the generator case and each of the terminal connections in turn. The resistance must not be less than 5 megohms.

## Chapter 2

### TACHOMETER GENERATOR, TYPE KGA0401

#### Description

1. The tachometer generator, Type KGA0401 (Ref. No. 6A/8813) is a 2-pole, 3-phase machine of the same construction as the generator described in Chap. 1. The generator has a splined drive coupling, and the stator leads are connected to a terminal box mounted on the rear end casing. The oil seals

fitted to this generator are not proofed against Ester-based oils.

#### Testing

2. If serviceability of the generator is suspect it is to be tested as detailed in Chapter 1-1.



## Chapter 3

### TACHOMETER GENERATOR, TYPE KGA0403

#### Description

1. The tachometer generator, Type KGA0403 (Ref. No. 6A/4420) is of the same construction as the generator described in Chapter 1. It is driven either from the engine through a reduction gearbox, or from the helicopter rotor through a step-up gearbox. The generator has a splined drive coupling, and the stator leads are wired to a 4-pole plug

mounted on the rear end casing. The oil seals fitted to this generator are proof against Ester-based oils.

#### Testing

2. If serviceability of the generator is suspect, it is to be tested as detailed in Chapter 1-1.

## Chapter 4

### TACHOMETER GENERATOR, Mk. 8 (TYPE KGA0404)

#### Description

1. The tachometer generator, Mk. 8 (Ref. No. 6A/2237) is a 2-pole, 3-phase machine of the same construction as the generator described in Chapter 1. The generator has a splined drive coupling, and the stator leads are connected to a terminal box mounted on the rear end casing. The oil seals

fitted to this generator are not proofed against Ester-based oils.

#### Testing

2. If serviceability of the generator is suspect, it is to be tested as detailed in Chapter 1-1.

## Chapter 5

### TACHOMETER GENERATOR, TYPE KGA0409

#### Description

1. The tachometer generator, Type KGA049 (Ref. No. 6A/8814) is of the same construction as the generator described in Chapter 1. The generator has a splined drive coupling, and the stator leads are connected to a terminal box mounted on the rear end casing. To suit particular installation

requirements, the terminal box is located 60 deg. from the vertical. The oil seals fitted to this generator are not proofed against Ester-based oils.

#### Testing

2. If serviceability of the generator is suspect, it is to be tested as detailed in Chapter 1-1.

## Chapter 6

### TACHOMETER GENERATORS, TYPE KGA 0407 AND 0411 KGA/CP/1

#### Description

##### *Type KGA 0407*

1. The tachometer generator, Type KGA 0407 (*Ref. No. 6A/8169*) is a two-pole, 3-phase machine driven from the engine through a reduction gearbox, or driven from a helicopter rotor through a step-up gearbox. The generator is of the same construction as the basic type described in Chap. 1, the stator being wired to a 3-pole plug. The oil seals fitted to this generator are proof against Ester-based oils.

##### *Type 0411 KGA/CP/1*

2. This generator (*Ref. No. 6A/12656*) is identical in construction to the type described in para. 1, but has a different type of electrical connector.

#### Testing

3. If the serviceability of the generator is suspect, it is to be tested as detailed in Chapter 1-1.