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DUAL TACHOGENERATORS
B16206A, B17140A AND B18206A

GENERAL AND TECHNICAL INFORMATION
REPAIR AND RECONDITIONING INSTRUCTIONS

BY COMMAND OF THE DEFENCE COUNCIL

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
Service users should send their comments through the channel
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Naval Aircraft Maintenance Manual (RN)

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AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in
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and insert the date of incorporation

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1	 AUG 83	18/5/90
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MODIFICATION STANDARD

The principal modifications which have been incorporated in the equipment covered in this publication have been listed below. Many of the modifications listed contain several actions. The purpose column describes the principal item only. Reference should be made to the actual modification document for full details.

Gnome Mod.No.	H.S.D.E Mod.No.	B16206A	B17140A	B18206A	PURPOSE
724	BK30002	*			Adds mod. plate
-	BK30003	*			Shaft cover
855	BK30010	*			Output terminals
-	FS22054	*			Introduces Wessex application
1167	BK30022	*			Stator assembly
1168	BK30023	*			Stator winding
1275	FS22740		*		Introduces Queens Flight application
1221	BK30031	*	*		Improved external protection
1554	FS30041	*	*		Fixing of nameplate
-	FS40373	*	*		Shaft protection cover
-	FS40937			*	Introduces Sea King application
-	FS40462	*	*	*	Rotor shaft assembly
-	FS40478	*	*	*	Paint scheme
2200	FS40839	*	*	*	Change of spacer
-	FS40904	*	*	*	New labels
-	FS41069	*	*	*	New paint scheme
2322	FS41187	*	*	*	Change of connectors
2335	FS41190	*	*	*	Change of bearings
2336	FS41194	*	*	*	Rotor and stator assemblies (Change of manufacturer)

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GENERAL AND TECHNICAL INFORMATION (-1)

Chapter 1

DUAL TACHOMETER GENERATORS TYPE B16206, B17140A AND B18206A

DESCRIPTIONIntroduction

1. Other than minor differences in the case mounting flanges the type B16206A, B17140A, and B18206A generators are identical in construction and operation. Each dual tacho-generator (fig.1) provides two independent outputs, one single phase and the other three phase. The level and frequency of the outputs are dependent on the shaft rotation speed.

2. The single phase output is 42V at 840Hz into an open circuit when the generator is running at 4200 rev/min.

3. The three phase output is 35V per phase at 70Hz into an open circuit when the generator is running at 4200 rev/min. When supplying a load of three star-connected 40 ohm resistors, the output is 21V.

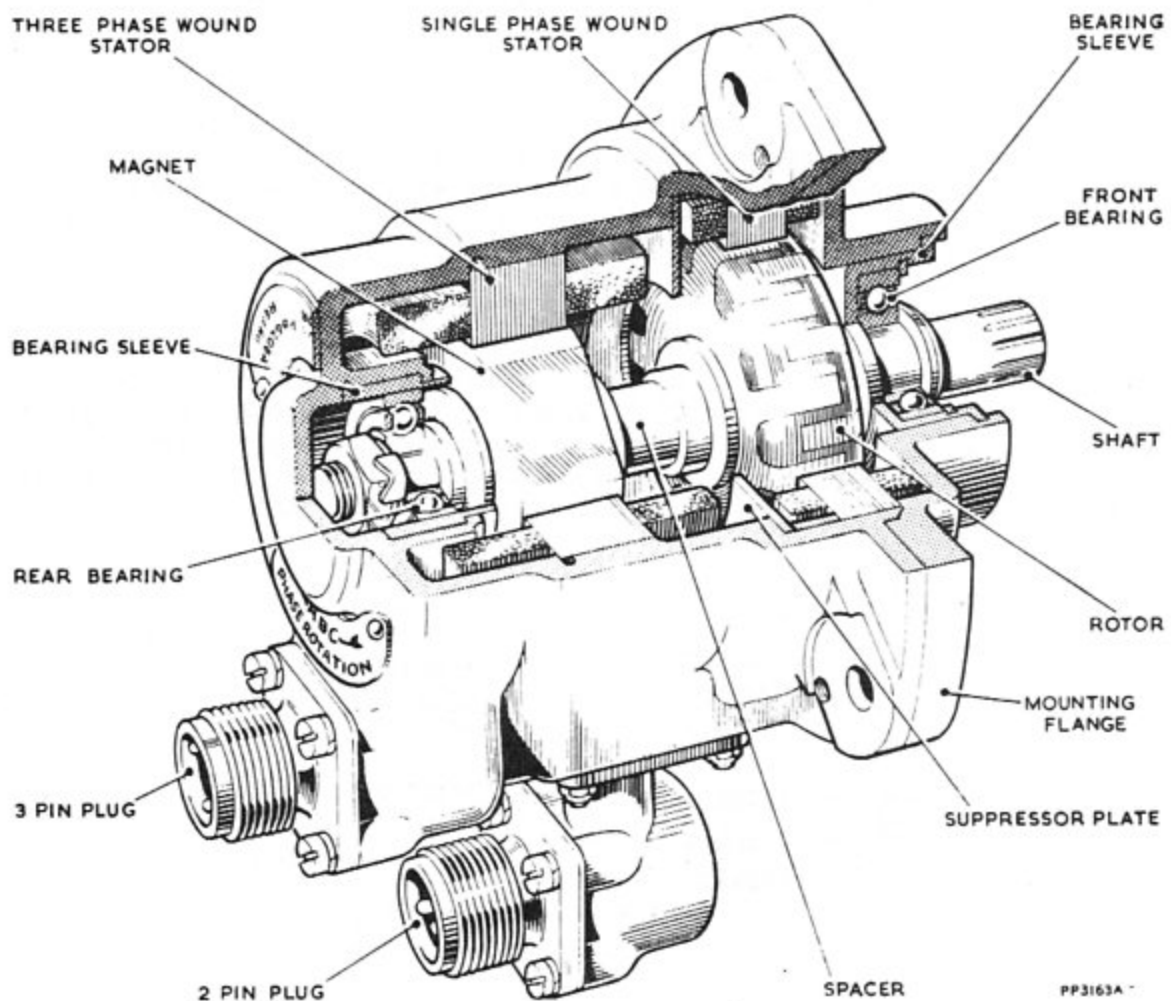


Fig.1 Dual tacho-generator - sectional view

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Casing

4. A common light alloy casing houses the two stator windings. The rear bearing housing is also contained in the case. The front bearing housing is located in the end flange which is used for mounting the unit.

Stator windings

5. The stator windings consist of:-

(1) A three phase star-connected winding located in the rear portion of the casing. The free ends of the winding are connected to a three pole plug mounted on the rear of the casing.

(2) A single phase winding located in the front portion of the casing. The free ends of the winding are connected to a two pole plug mounted on the underside of the casing.

Rotor shaft

6. Two rotors are mounted in tandem on a single shaft which is located and supported by ball bearings at the front and rear ends. The front end of the shaft is splined to accept the drive from the engine on which the unit is installed. The bearings are lubricated with grease to DTD5598.

Rotors

7. The single phase rotor is a twenty-four pole potted permanent magnet of the meshing claw type with twelve poles at each end. It is mounted on the front portion of the shaft and rotates within the single phase stator. The three phase rotor is a two pole permanent magnet mounted on the rear portion of the shaft. It rotates within the three phase stator.

OPERATION

8. The rotor shaft is driven by the engine on which the unit is mounted. As the shaft rotates the interaction of the magnetic fields of the stator windings and the rotors induces an e.m.f. in each stator, so producing alternating voltages at the output plugs. The frequencies and amplitudes of these voltages are directly proportional to the speed of rotation of the rotors.

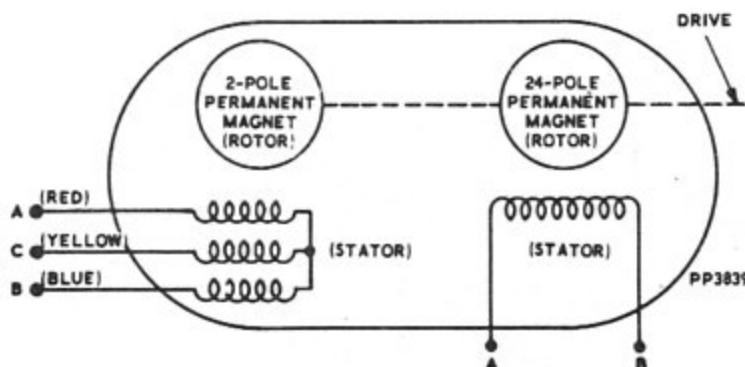


Fig.2 Circuit diagram

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Chapter 2

STANDARD SERVICEABILITY TESTS

TYPES B16206A, B17140A AND B18206A

Introduction

1. The Standard Serviceability Test described in this chapter is to be performed on a dual tacho-generator at normal overhaul periods, or at any time the serviceability of the unit is suspected. If the unit fails to meet the limits specified then carry out the procedure in Chapter 3.

TEST EQUIPMENT

2. The following items of test equipment are required:-

- (1) Dual tacho-generator tester type 20048
- (2) Tuning fork (part of tester)
- (3) Gearbox type 1387
- (4) Drive adapter type 1530
- (5) a.c. Voltmeter $\pm \frac{1}{2}\%$ f.s.d. 1000 ohm/V
- (6) 2 pin socket MS-3102E-10SL-4P
- (7) 3 pin socket MS-3102E-10SL-3P
- (8) Dummy load consisting of 3 non-inductive, star-connected 5W 40 ohms $\pm 1\%$
- (9) Dummy load as above but 20 ohms $\pm 1\%$
- (10) Frequency counter Racal Model 836, Ref.No.0657-5226577 or frequency counter Type 3734A, Ref.No.6625-99-1070130.

Setting-up dual tacho-generator tester

3. (1) Connect a 220/250V 50Hz supply to the tester and connect the tuning fork to the tester using the leads supplied.
- (2) Fit the gearbox to the locating ring on the tester.
- (3) Fit the drive adaptor to the gearbox.
- (4) Connect the generator to the tester by locating the splined end of the generator shaft in the adaptor drive and secure it in position.

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Single phase output

4. (1) Connect a 50V a.c. voltmeter and the frequency counter to the two pin plug by means of the two pin socket.
- (2) Set the tester rotation switch fully clockwise.
- (3) Switch on the tester and tuning fork and strike the tuning fork knob.
- (4) Adjust the speed to 4200 rev/min by means of the control knob. The speed is determined by the pattern of illuminated spots on the stroboscopic drum. Select the required speed by referring to the chart on the tester case.
- (5) The output indicated on the voltmeter should be between 41.25V and 42.75V. The frequency indicated on the counter should be a stable 840Hz.
- (6) Switch off the tester and remove the voltmeter from the single phase output.

Three-phase output

5. (1) With the generator fitted to the tester as in paragraph 3, connect a non-inductive load of three star-connected 5 watt resistors each of 40 ohms $\pm 1\%$ to the three pole plug by means of the three pole socket.
- (2) Make provision to monitor the voltage between each pair of poles of the three pole plug using the 0-50V a.c. voltmeter.
- (3) Set the tester rotation switch fully clockwise, switch on the tester and strike the tuning fork knob.
- (4) Adjust the speed to 4200 rev/min (refer to paragraph 4 (4)).
- (5) Using the 0-50V a.c. voltmeter measure the output voltage across each pair of poles on the three pole plug in turn. The output must be between 20V and 22V in each instance.
- (6) Switch off the tester and remove the load. Connect a non-inductive load of three star-connected 5 watt resistors of 20 ohms $\pm 1\%$ to the three pole socket.
- (7) Switch on the tester and adjust the speed to 1000 rev/min.
- (8) Using the 0-50V a.c. voltmeter measure the output voltage across each pair of poles on the three pole plug in turn. The output must be not less than 3.5V in each instance.
- (9) Remove the test equipment and disconnect the generator from the tester.

Insulation resistance test

6. With the generator at normal running temperature, measure the insulation resistance between the plug pins and the generator casing. The value in each instance should not be less than 20 megohms at 500V.

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