Chapter 58

GRIMES OSCILLATING LAMP, TYPE G-9950-4

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LEADING PARTICULARS

Lamp oscillating, Grimes type G-9950-4	*Ref. No. 5CX/5521*
Lamp filaments, type A7079A-24 ... ... 28 *volt* 40 *watts*	*Ref. No. 5L/2641*
Motor, Globe Ind, type C-25A-515	*Ref. No. 5CX/*
Lens glass, red	*Ref. No. 5CX/5525*
Input	28 *volt d.c.*
Motor speed, at rated voltage	9000—10000 *r.p.m.*
Motor current	0·12 *amp*
Weight	2 *lb.* 8 *oz.*
Overall dimensions (excluding connector) ...	10 *in.* × 5·25 *in.* × 2·37 *in.*

Introduction

1. The Grimes tandem oscillating lamp Type G—9950—4 is a twin filament, motor driven, flashing lamp used as an anti-collision or rendezvous lamp (shown in fig. 1). The lamp can be mounted on the aircraft upper or lower surfaces and is so designed to minimise drag in flight; when installed only the lens protrudes above the aircraft skin. The lamp is designed to give 80—90 flashes per minute and is supplied from a 28 volt source, each filament lamp is of 40 watt and the motor 3·3 watt.

DESCRIPTION

Filament lamps

2. The filament lamps are 28 volt 40 watt, single contact, bayonet cap filaments, with the glass envelope mirror finished over approximately 60% of its surface area. This causes the lamps to give a beam of light and not general illumination. The locating pins of the bayonet cap are positioned at different levels of the cap, thus ensuring that the lamps are correctly fitted in the lamp holders. The lampholders are fitted on the fore and aft axis of the lamp and so assembled that the lamps face 180 degrees apart; that is, one facing forward, and one facing aft, as shown in fig. 1.

Lamp lens

3. The lamp lens is constructed of toughened red glass and is attached by a centrally positioned securing screw and by a retaining clip at the rear, the clip fitting over a tongue on the lens. The lens is sealed by a rubber sealing strip, should ingress of moisture or condensation occur provision for drainage is made, by a drain hole in the head of the lens securing screw, normally sealed by a grub screw but removed for inverted fitment.

Lamp mechanism housing

4. The lamp mechanism is enclosed in a housing of pressed steel consisting of a lower and upper casing. The upper casing incorporates the lens flange by which the lamp is secured by 4 fixing holes. The lower casing carries the electrical socket connector and two drain tubes, for normal fitment. The lens flange has three apertures, through one the lamp motor is visible, through the other two are fitted the lamp filaments, it should be noted that before removal of the upper casing the lamps must first be removed from the lamp holders.

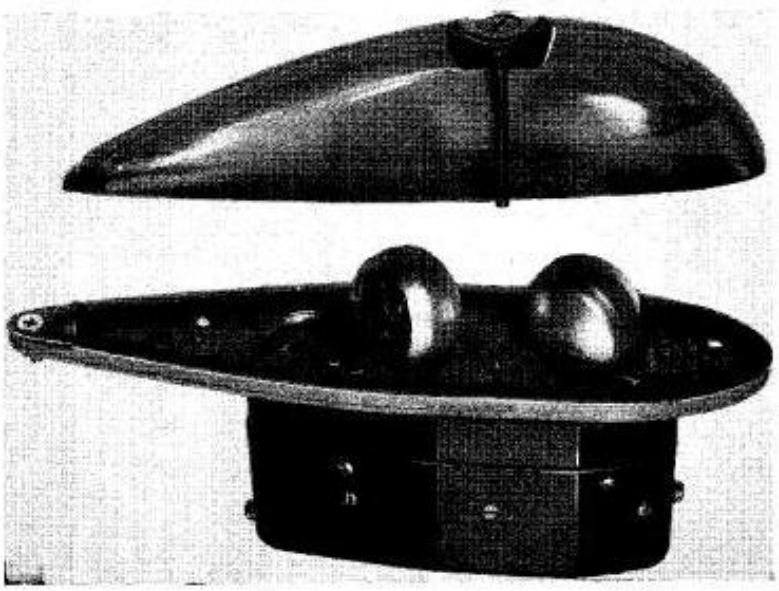

Fig. 1. General view of lamp with lens removed

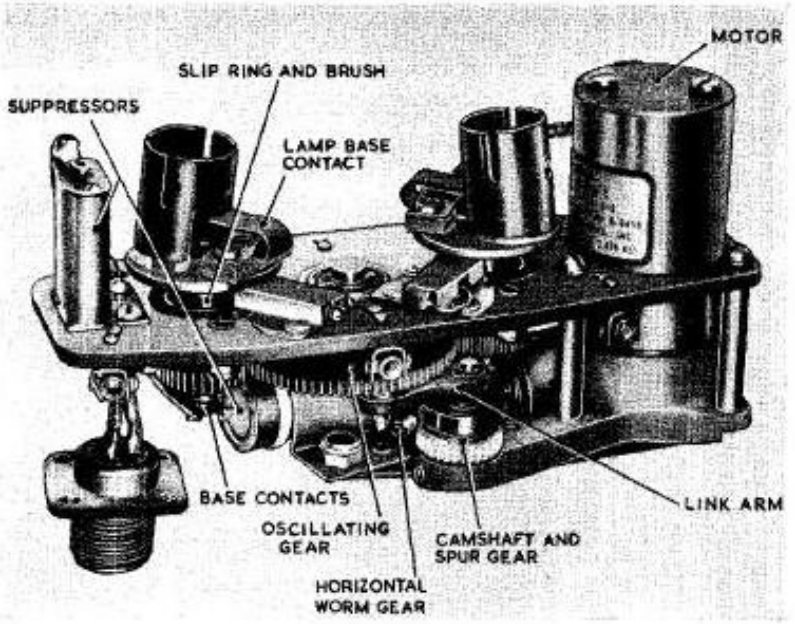

Fig. 2. Lamp mechanism

Motor and gear assembly

5. The motor is a permanent magnet, 28 volt d.c., totally enclosed motor with a worm drive secured to the shaft. The motor is vertically mounted through a hole in the mechanism top plate and secured by two screws passing through the lower casting, shown in fig. 2. The motor steel worm drives the horizontal shaft through a nylon spur gear secured to the shaft, which rotates in two bearings fitted to the lower casting; at the other end of the horizontal shaft is a worm gear. Bearing on the end of the shaft and nylon spur gear is a felt oil pad which is lubricated with oil OX—14 (Ref. No. 34B/9100590).

Spur gear, camshaft and link arm

6. The spur gear and cam shown in fig. 2 consist of a nylon spur gear and eccentric steel cam secured together, each running on bearings fitted to the camshaft. The camshaft is fitted in the lower casting and secured by a grub screw. The nylon spur gear and cam are driven by the horizontal worm gear, and on the eccentric face of the cam is a pivot to which is pivoted the link-arm which is retained by a circlip. The other end of the link arm is attached to a pivot on the under face of the oscillating gear. Thus as the cam is rotated linear movement is imparted to the link arm.

Oscillating gear and lamp holders

7. The linear movement of the link-arm is used to turn the oscillating gear to and fro in an oscillatory motion. The oscillating gear which is made of fibre, drives the brass spur gears fitted to the lamp holder shafts, these oscillate with the same time as the oscillating gear, turning through approximately 182 degrees. Each lamp holder is silver soldered to its shaft, the shaft being hollow and rotating in a bearing fitted in the mechanism top plate.

Electrical connections

8. Electrical connection to the lamp is made using a three pole CANNON connector (AN 3102A—10SL—3P) of which only two pins are used, pin A positive, pin B negative, as shown in the circuit diagram in fig. 3. The motor is connected via a suppressor directly across the supply, the lamps are

connected to the supply by means of a slip ring and a contact on each lampholder assembly (shown in fig. 2). The positive connection is made through the base contacts, one contact being a stationary leaf-spring, bearing upon the other contact which is fitted in the lamp holder shaft. This contact is insulated from the lamp holder and the lamp holder shaft but rotates with them, a lead soldered to the contact runs through the centre of the shaft to the lamp base contact which is also insulated from the lampholder as shown in fig. 2. The negative connection is made by a brass slip ring at the base of the lamp holder and an earthed brush.

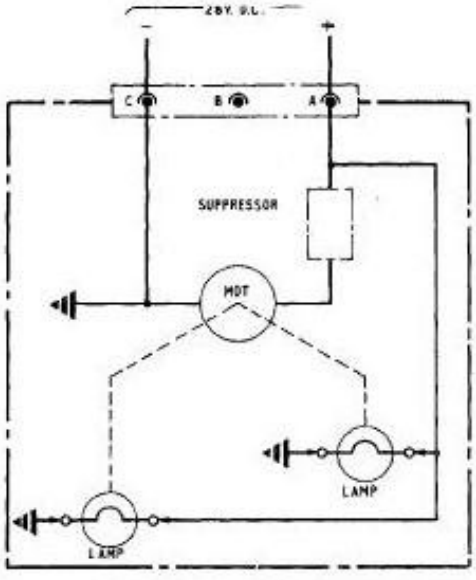

Fig. 3. Circuit diagram

SERVICING

9. Servicing should be confined to inspection for freedom from damage and corrosion, and replacement of the lens and filament lamp. To renew the lens or to gain access for replacement of the filament lamp, the lens retaining clip and lens securing screw should be unscrewed and the lens removed. The lens sealing strip should be checked at all occasions when the lens is removed and replaced if showing signs of deterioration.

10. Inspection of the mechanism may be carried out by removal of the mechanism housing, the lens and the filament lamps must first be removed. The upper casing may then be removed by removing the top two cheese headed screws on each side of the lamp and slowly working the mechanism out of the upper casing. With the upper casing removed the lamp holders, brushes and slip rings, and the motor are visible for inspection. To remove the lower casing, remove the three remaining screws on each side of the lamp, and the eight cheese headed screws on the base (four securing the mechanism, four securing the connector). The mechanism can then be taken out of the casing. If required the gears and the link arm may be lubricated with a light smear of grease XG276 (Ref. No. 34B/9425139) and the felt oil pad may have a few drops of oil OX14 (Ref. No. 34B/9100590) added.

Testing

11. A functional test should be carried out after all servicing, using a 28 volt d.c. supply and the oscillation of the lamp checked to ensure that the correct 80—90 flashes per minute are given. The functional test should be repeated using a 20 volt d.c. supply, the lamp must start and run satisfactorily with no flickering or dimming of the lamps.

Note . . .

The suppressor and the capacitor should not be subjected to test by any instrument having an output in excess of 100*V. A standard insulation resistance tester must not be used.*