# Chapter 59

# GRIMES ANTI-COLLISION LAMPS, ROTATING REFLECTOR TYPE

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### Introduction

**1.** The Grimes rotating reflector lamps, Type G7435—2, G7320—7 and G7410—6 are used as anti-collision lamps and warning beacons. The lamps may be fitted on the upper and/or lower aircraft surface and present a flashing beam of light visible over a large area, and are controlled by an ON—OFF switch in the aircraft cabin. The lamps give approx. 90 flashes per minute emitted by two reflectors rotating at 45 r.p.m., the flashes are of varying brilliance due to the design of the reflectors. The various lamps differ in minor constructional details and signal characteristics only, this chapter deals with the typical lamp and details of individual lamps will be found in the Appendices to the Chapter.

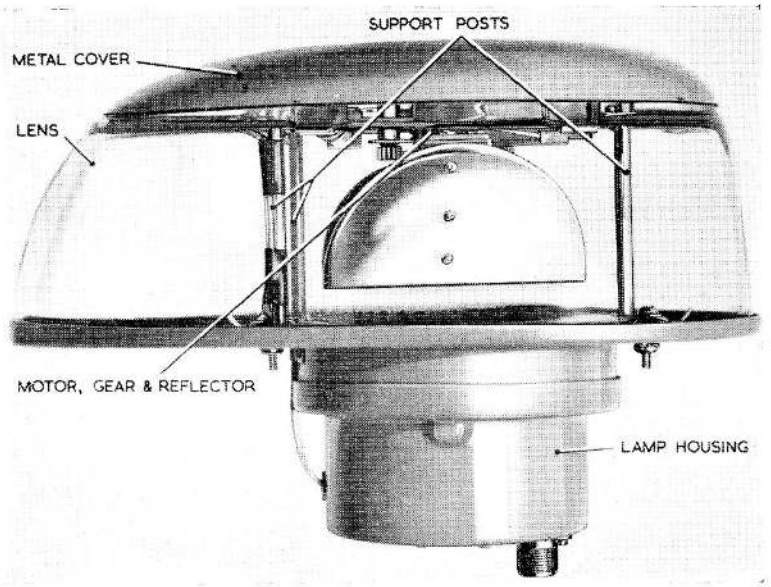


Fig. 1. General view of typical lamp

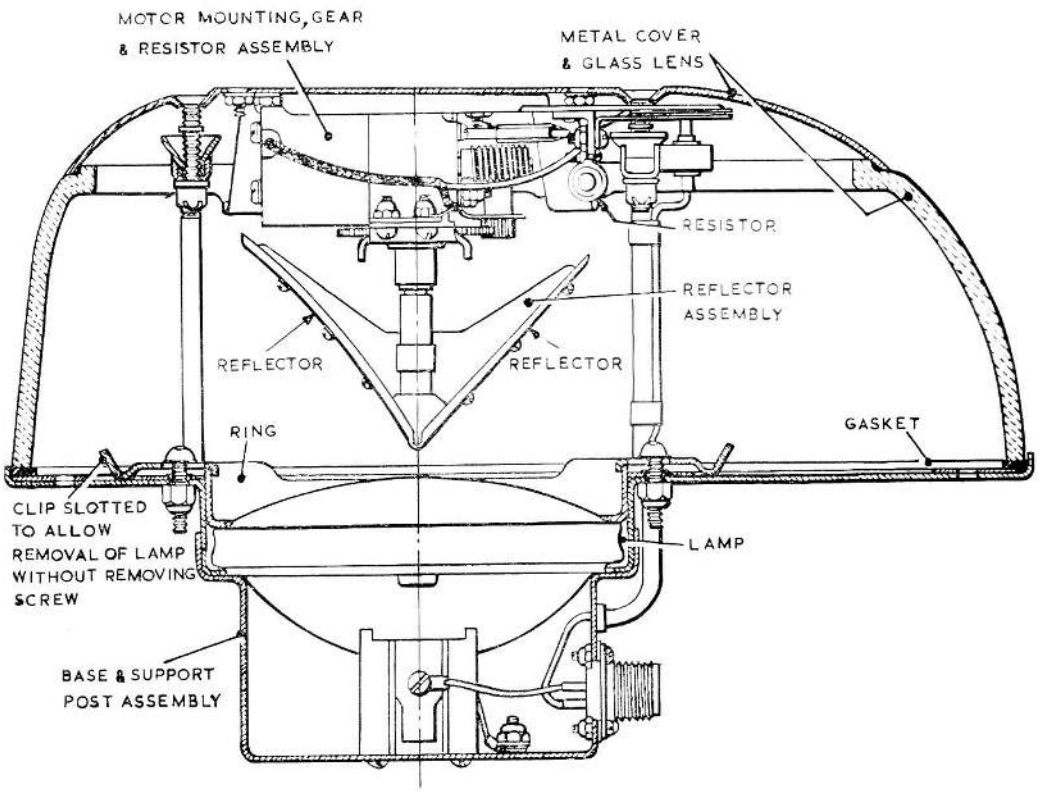


Fig. 2. Part sectional view of typical lamp

## DESCRIPTION

**2.** The lamp consists of two basic sub-assemblies, the base and filament lamp housing, and the lens and cover which incorporates the motor, gear and reflector assembly and is removable to facilitate filament lamp renewal. The lamp is shown in fig. 1 and a part sectional view given in fig. 2.

### Base and filament lamp housing

**3.** The base and filament lamp housing are pressed, light alloy sections the lamp housing being rivetted to the lower rim of the base, the assembly is secured to the airframe by six screws which pass through holes in the base to nuts anchored to the airframe. Contained in the lamp housing are the lamp holder and filament lamp, the electrical connector plug and provision for moisture drainage. The position of these vary with individual lamps and details are given in the Appendices. The base incorporates the support posts for the lens and cover assembly and has a flanged rim into which the lens fits.

**4.** The lampholder is a moulded rectangular lampholder into which the sealed beam filament lamp seats on to two leaf-spring contacts. Location and positive positioning of the filament are achieved by means of a glass locating lug on the filament lamp which locates with one of two grooves in the rim of the lamp housing well. The filament lamp is held in position by a retaining ring which bears on to the rim of the filament lamp, the retaining ring and lamp are held pressed into the well against the tension of the leaf-spring contacts by two clips. The clips are fixed to the base by two Phillips screws and are slotted to aid renewal of the filament lamp.

**5.** Attached to the base are four support posts, two at the front of the lamp and two at the rear, across each pair of posts is a bridge piece which carries the anchor nuts by which the cover and lens are secured. For ease of locating the securing screws, cone shaped guides lead into each nut. The rear bridge piece also carries the two spring loaded plunger contacts which form the motor supply disconnect break, and connect with the motor assembly contacts when the lens and cover are fitted.

### Lens and cover

**6.** The lens is of toughened red glass and the cover of pressed alloy, the upper rim of the lens fits into the flange of the cover and is secured by four spring clips and is bedded into a sealing compound. The lens and cover are removable as a single assembly to facilitate filament renewal by unscrewing the two countersunk headed Phillips screws, annotated REMOVE TO RELAMP. Also secured to the cover by three $\frac{1}{2}$-in. screws is the motor, gear and reflector assembly which is shown removed from the cover in fig. 3.

### Motor, gear and reflector assembly

**7.** The assembly consists of a permanent magnet, totally enclosed motor, driving gears and the reflector. The motor is supplied from the 28 volt d.c. supply via the disconnect break and the motor assembly contacts. Attached to the shaft of the motor is a brass worm gear which drives the brass reflector gear through a nylon and steel spur gear assembly. The nylon and steel spur gears are secured on a common shaft. The reflector gear is secured to the reflector assembly shaft and thus rotates the reflectors. The reflectors are of polished aluminium and are formed to different angles to give the two beam characteristics of the lamp, they are secured to the reflector assembly by six round headed screws.

### Electrical connections

**8.** Electrical connection to the lamp is by means of a 2 or 3 pole plug which may be positioned in the rear or base of the lamp housing. The supply being taken direct to the lamp holder and via the disconnect break and contacts to the motor. Incorporated in the motor circuit is a radio suppressor and a variable resistor for speed control, which is preset and will not normally require adjustment. Circuit diagrams of individual lamps are given in the Appendices to this chapter.

## INSTALLATION

**9.** The lamps are fitted to the aircraft with the base flush with the aircraft skin and require a functional check only before installation. Lamps fitted in an inverted position on the aircraft lower surface will require the two drain hole screws removing from the metal cover, these are the two

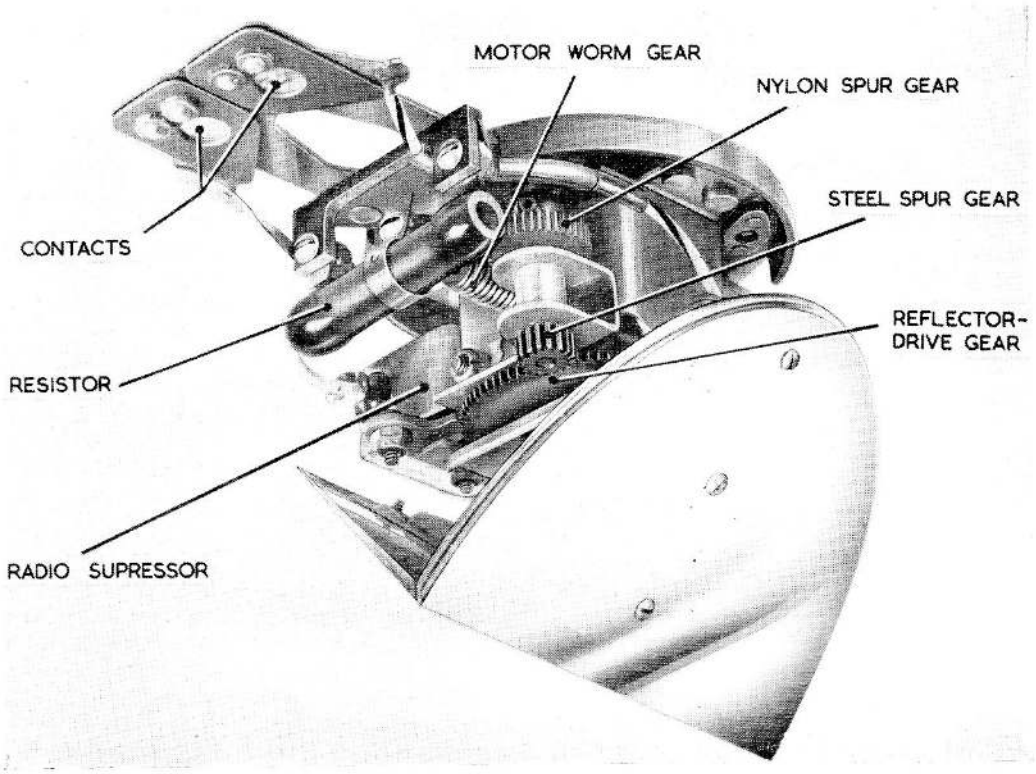


**Fig. 3. Typical motor, gear and reflector assembly**

$\frac{3}{16}$ in. diameter screws adjacent to the cover securing screws and are held in position by a plain nut and washer.

## SERVICING

**10.** Servicing of the lamp should consist of inspection for freedom from damage and corrosion, lubrication and renewal of the filament lamp and the lens. When inspecting for corrosion pay particular attention to the motor contacts and lamp holder contacts. The motor spring loaded plunger contacts should be checked for freedom of movement and spring tension. Lubrication of the gears may be carried out by a light application of grease XG276 (Ref. No. 34B/9425139). Lubrication of the spur gear shaft bearing and reflector assembly bearing may be carried out by the application of one or two drops of oil OX 14 (Ref. No. 34B/9100590) to each bearing. The motor bearings are lubricated for the life of the motor and no further lubrication is necessary, nor should it be attempted.

### Renewing the filament lamp

**11.** To renew the filament lamp unscrew the two cover securing screws annotated REMOVE TO RELAMP and remove the lens and cover assembly. Unscrew the two screws securing the retaining ring clips approximately three turns, until it is possible to raise and rotate the Z shaped clips clear of the retaining ring, whilst pressing the retaining ring into the lamp housing.

**Note . . .**

*In lamps fitted in the inverted position care must be taken as the filament lamp is now free to fall out.*

**12.** For upper mounted lamps, remove the retaining ring and using the blade of a screwdriver raise the edge of the filament lamp until it can be grasped and removed.

With the filament removed, check the lamp contacts for corrosion and freedom from damage, they may be polished if required using crocus paper (33c/537) but care must be taken not to bend or distort the contacts.

**13.** Remove the terminal screws from the new filament lamp and discard them, insert the lamp into the housing and rotate it, pressing lightly on the face of the lamp until the glass lug locates in one of the housing locating grooves and the lamp seats in the lamp holder. Refit the retaining ring and secure the two retaining ring clips.

**Note . . .**

*In lamps fitted in the inverted position, when inserting the new filament lamp it will simplify fitting the retaining ring if this is first placed on the wrist of the hand used to fit the filament lamp. The ring can then be raised over the wrist using the free hand whilst the filament lamp is held in position. The retaining ring and filament lamp can then be held and the ring clips secured.*

**Renewing the lens**

**14.** To renew the lens, the lens and cover assembly must first be removed from the base, the four lens clips can then be removed. It may be found more expedient to remove the clips by removing the securing screws and nuts, than to prise them from the inner lip of the lens. The lens sealing compound should be removed and the lens removed from the cover, the cover must have all the sealing compound cleaned off and a new bed made using Bostik glazing compound (Ref. No. 33c/591). The new lens should then be fitted and seated into the rim of the cover and the lens clips refitted. Care should be taken during the renewal of the lens to avoid excessive handling of the reflectors and damage or distortion of the motor contacts.

**Testing**

**15.** The lamp should be functionally tested on a suitable 28 volt d.c. supply after all servicing.

# Appendix 1

# ANTI-COLLISION LAMP, TYPE G7435-2

## LEADING PARTICULARS

| | |
|---|---|
| *Anti-collision lamp Type G7435-2* ... ... | *Ref. No. 5CX/5619* |
| *Filament lamp, sealed beam Type* 4594, 28*v*, 100*w* ... ... ... | *Ref. No. 5L/2642* |
| *Lens, red glass* ... ... ... ... ... | *Ref. No. 5CX/5542* |
| *Input voltage* ... ... ... ... ... ... | 28 *volt d.c.* |
| *Motor current* ... ... ... ... ... ... | ·150 *amp. max.* |
| *Reflector speed* ... ... ... ... ... ... ... | 45 *r.p.m.* |
| *Weight* ... ... ... ... ... ... ... ... | 3·9 *lb.* |
| *Connector, 2 pole plug* ... ... ... ... | *AN3102A-10SL-4P* |

This lamp is similar to that described and illustrated in the main chapter and the circuit diagram for the lamp is given in fig. 1. The 2-pole connector plug is situated at the front of the lamp housing base and provision for moisture drainage is made by two $\frac{3}{8}$ in. diameter holes in the base. The lamp holder is positioned at right angles to the longitudinal axis of the lamp and is secured to the base by four screws. The reflector is formed to give two beams of light, one of approximately 4000 candlepower visible at +5 to —5 degrees from the horizon, and one of 1000 candlepower visible at +20 to —20 degrees from the horizon, the horizon being taken as that formed by the base of the unit.

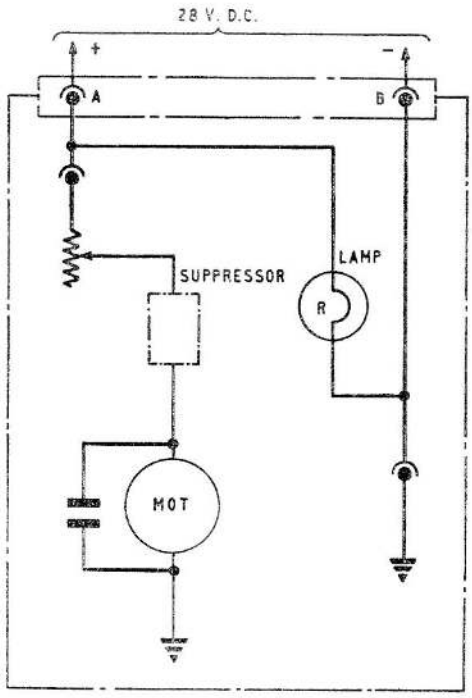


Fig. 1. Circuit diagram

## Appendix 2

# ANTI-COLLISION LAMP, TYPE G7320-7

### LEADING PARTICULARS

| | |
|---|---|
| *Lamp Anti-collision lamp, Type* G7320-7 ... ... | *Ref. No.* 5*CX*/5399 |
| *Filament lamp, sealed beam... ... ... ...* *Type* 4594 28*v.* 100*w.* | *Ref. No.* 5*L*/2642 |
| *Lens, red glass ... ... ... ... ...* | *Ref. No.* 5*CX*/5542 |
| *Input voltage ... ... ... ... ... ... ...* | 28 *volt d.c.* |
| *Motor current ... ... ... ... ... ...* | ·150 *amp. max.* |
| *Reflector speed ... ... ... ... ... ...* | 45 *r.p.m.* |
| *Weight ... ... ... ... ... ... ... ...* | 3·9 *lb.* |
| *Connector, 3 pole plug ... ... ...* | *AN* 3102*C*-10*SL*-3*P* |

This lamp is similar to that described and illustrated in the main chapter and the circuit diagram for the lamp is given in fig. 1. The 3 pole connector plug is situated at the rear of the lamp housing and provision for moisture drainage is made by a $\frac{3}{8}$ in. diameter drain tube on the rear of the lamp housing adjacent to the connector plug. The lamp holder is positioned at right angles to the longitudinal axis of the lamp and is secured by four screws.

The reflector is formed to give two beams of light, one of approximately 4000 candlepower visible at 0—9 degrees above the horizon, and one of 1000 candlepower visible at 0—25 degrees above the horizon, the horizon being taken as that formed by the base of the unit.

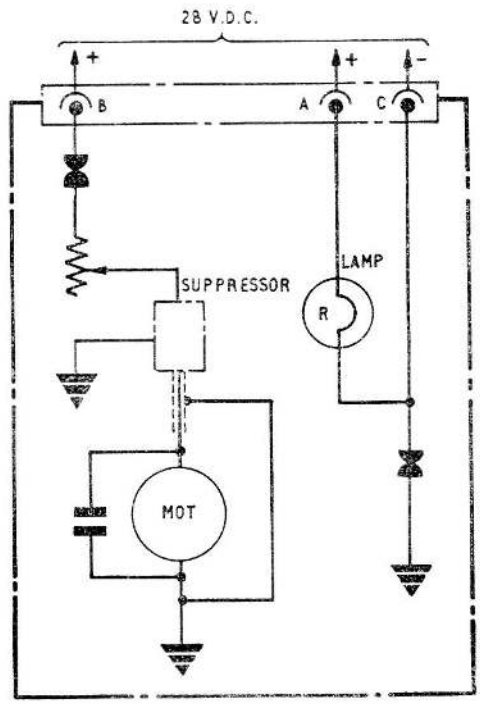


Fig. 1. Circuit diagram

# Appendix 3

# ANTI-COLLISION LAMP, TYPE G7410-6

## LEADING PARTICULARS

| | |
|---|---|
| *Anti-collision lamp Type G7410-6* ... ... ... | *Ref. No. 5CY/5596* |
| *Filament lamp, sealed beam... Type* 4594, 28*v* 100*w* ... ... ... | *Ref. No. 5L/2642* |
| *Lens, red glass* ... ... ... ... ... | *Ref. No. 5CX/5542* |
| *Input voltage* ... ... ... ... ... ... ... | 28 *volt d.c.* |
| *Motor current* ... ... ... ... ... | ·150 *amp. max.* |
| *Reflector speed* ... ... ... ... ... ... | 45 *r.p.m.* |
| *Weight* ... ... ... ... ... ... ... ... | 3·9 *lb.* |
| *Connector, 3 pole plug* ... ... ... ... | *AN* 3102*C*-10*SL*-3*P* |

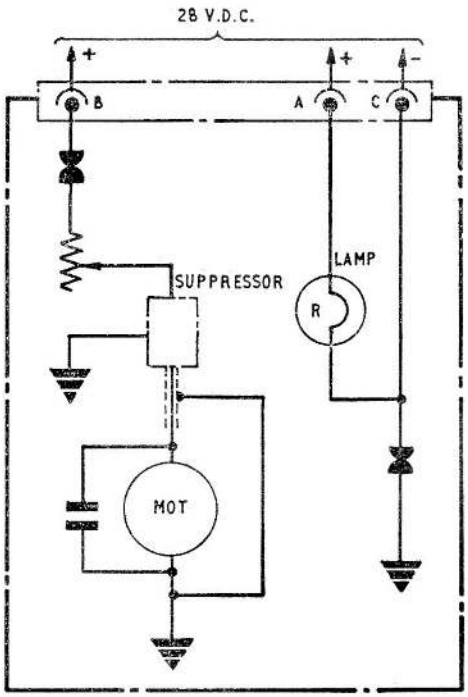


**Fig. 1 Circuit diagram**

This lamp is similar to that described and illustrated in the main chapter and the circuit diagram for the lamp is given in fig. 1. The 3 pole connector plug is situated in the centre of the lamp housing base and provision for moisture drainage is made by two $\frac{3}{8}$ in. diameter holes in the base. The lampholder is positioned along the longitudinal axis of the lamp and is secured by four screws.

The reflector is formed to give two beams of light, one of approximately 4000 candlepower visible at 0—9 degrees above the horizon, and one of 1000 candlepower visible at 0—25 degrees above the horizon, the horizon being taken as that formed by the base of the unit.



81490) Gp.375/1. D.2509/Wt.41099/575389/L.P.S. 2625/5/61.