Chapter 29

LANDING LAMP, HARLEY, TYPE 11KDC

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Landing lamp, Harley, Type 11KDC	Stores Ref. 5CX/5181
Lamp, filament (special) two filament, 750/240 watts ...	Stores Ref. 5L/X959804
Operating unit (Plessey Jaguar Type CZ64337/1C) ...	... Stores Ref. 5W/414
Front glass	... Stores Ref. 5CX/5260
Lens	... Stores Ref. 5CX/5263
Weight	... ... 17 lb.
Extended angle (for Comet aircraft)	... 84 deg 30 min.

Introduction

1. The Harley landing lamp, Type 11KDC, is designed for use in large aircraft. It can be extended at airspeeds up to 150 knots by power operation from remote control. Selection of "landing" or "taxying" beam is made by using alternative filaments within the bulb.

DESCRIPTION

General

2. The lamp consists (*fig.* 1) of three main castings, viz., the outer frame casting which takes the weight of the lamp in the aircraft; the inner frame casting or filament housing which is retractable, and the lens frame casting which carries the lens and bulb holder and locates the reflector.

Outer housing

3. The outer housing or frame casting incorporates the flange by which the lamp is secured to the airframe structure. To this flange is fitted the tufnol bearings which support the retractable filament housing. This casting also includes brackets to which the terminal block is fixed and a bracket supporting the trunnion end fitting of the actuator. A cone shaped back cover is attached by screws to the rear of the casting.

Operating unit

4. The filament housing is power operated by an electric actuator. This contains a series motor having alternative field windings by which direction of rotation can be selected

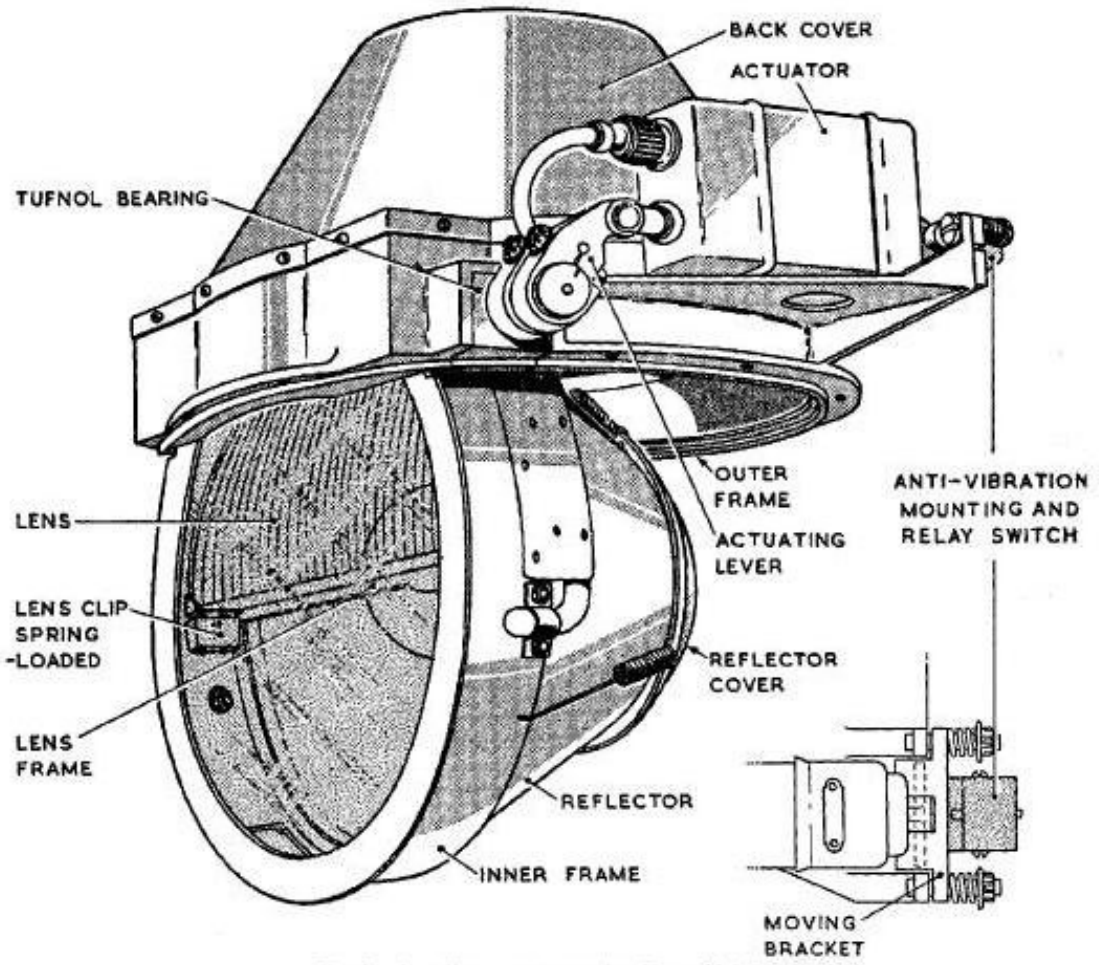

Fig. 1. Landing lamp, Harley Type 11 KD

to either "extend" or "retract" the filament housing. The motor is rendered deadbeat by the incorporation of an electromagnetic brake. Through suitable reduction gearing the motor transmits power to the lead screw of the actuator plunger or ram which lies parallel to but is off-set from the motor. The general design detail of the Plessey Jaguar type of actuator is described in A.P.4343, Vol. 1, Sect. 17. The particular actuator used in this lamp does not have a slipping clutch. The actuator limit switches are set by the manufacturers during assembly and should not normally require adjustment.

5. The actuator is supported at its plunger end by the pin which couples it to the actuating lever and at the trunnion end by a spring loaded bracket. This bracket moves to compress springs during the final retracting movement of the filament housing. The spring compression takes up any slackness in the operating linkage and holds the filament housing firm against vibration when housed. The bracket movement also operates the micro switch in the filament relay circuit.

Filament housing

6. The inner frame casting or filament housing pivots on 1·00 in. journals in the bearings on the outer frame. Viewed from the front the right hand journal carries a light alloy actuating lever which, at its outer end, couples to the eye fitting of the actuator plunger. The filament housing carries the front glass with its sealing ring secured in place by a clamping ring held by screws to the housing casting. Also attached by screws to this housing is the lens frame assembly which includes the bracket supporting the bulb. The coiled springs which locate the reflector hook into holes provided in the inner frame casting.

Lens frame assembly

7. The lens frame casting is machined, and fits into the inner frame, to which it is secured by screws, nuts, and washers. The frame has a cross member which supports the lens, and forms the fixed half clamp for the bulb cap. The flexible cable to the bulb terminals is clipped to this frame. The lens is held in three clips, the two lower clips being spring-loaded, and attached to the cross member; the upper clip, attached to the frame, is rubber padded. This arrangement allows for expansion of the lens.

8. The rim of the reflector locates against the lens frame casting and is supported by the reflector cover. This cover is held in place by a spring loaded retainer ring, which fits over the rear of the cover, the four retaining springs hooking into holes in the inner frame casting.

Filament lamp

9. The light source in this landing lamp is a twin filament, gas-filled bulb. The main, or landing beam filament is rated at 750 watts. The secondary, or taxying beam filament, which is slightly offset from the focal point of the lamp, is rated at 240 watts. These filaments are designed to operate at 26 volts to allow for a 2 volt drop in the supply system.

10. The filament bulb cap has a locating spigot fitted on the side and has three 2 B.A. terminal screws, nuts and washers forming the cable connections at the rear of the bulb. The terminals are colour coded to match the flexible cable cores, thus :—

Red	..	Main filament
Yellow	..	Secondary filament
Blue	..	Common

11. The bulb is secured by its cap in a clamp held by two screws to the cross member of the lens frame casting. The filament is accurately positioned when the spigot on the cap locates in the hole provided in the fixed half of the securing clamp.

Electrical connections (*fig. 2*)

12. The filament control is through relays connected to a three position, centre 'off' switch. The power supply to the relays is

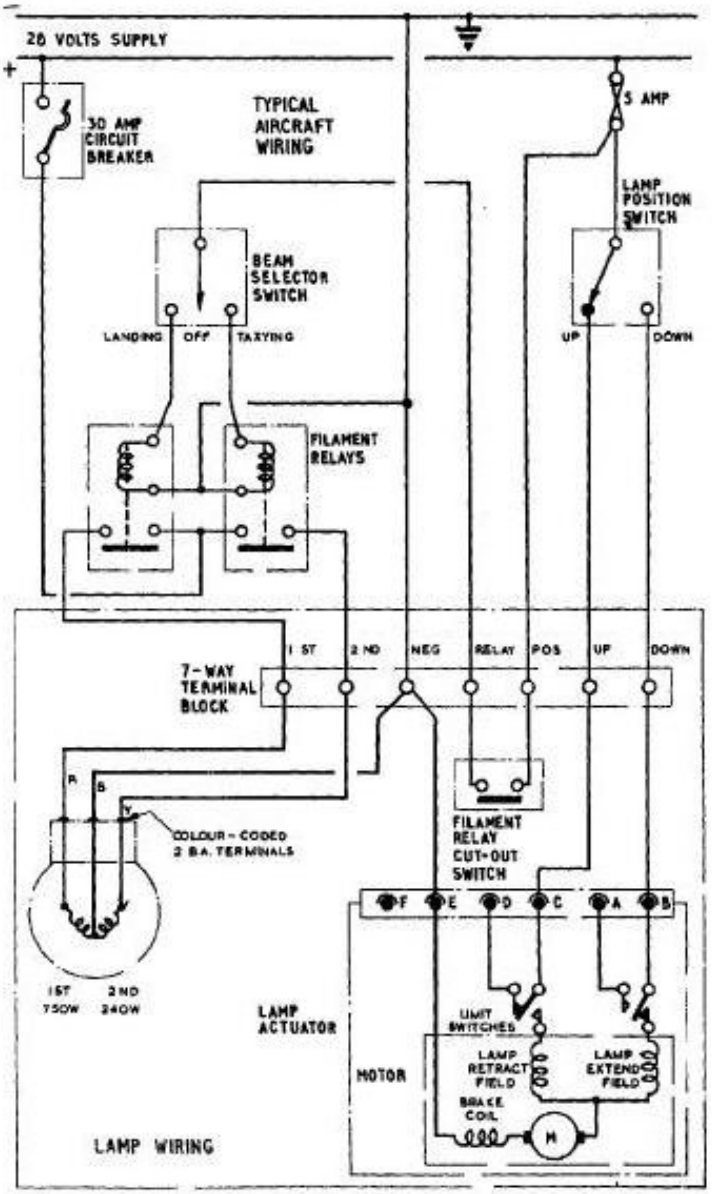

Fig. 2. Circuit diagram

taken through a snap action switch fitted on the outer frame casting and actuated by the final retracting motion of the filament housing. This ensures that the filaments are switched "off" before the lamp is finally retracted. The filament relays are mounted separately from the lamp as part of the aircraft wiring.

13. A seven way terminal block is mounted at the rear of the outer frame casting. The flexible cables to the filament bulb and the actuator plug normally connect to these terminals but in some instances the actuator may be directly connected as part of the aircraft wiring.

14. The actuator control is a two position switch which selects the motor field for the required direction of movement of the filament housing. It should be noted that the retracted position of the lamp corresponds with the extended or "ram out" position of the actuator plunger and these must not be confused.

SERVICING

General

15. Inspect the lamp for cleanliness of the front glass, bulb and reflector. If the bulb glass shows signs of general blackening the efficiency is reduced, or if white streaks are apparent it is indicative of a leaking glass seal. In these instances the bulb should be renewed. While the filament housing is dissembled for renewal of parts, clean the front glass lens, bulb and reflector. To avoid fingerprinting these components use a soft clean cloth. Use no polish or abrasive for cleaning; soapy water may be used to remove dirt, then dry with a soft cloth.

Bulb renewal

16. Actuate the lamp to the extended position. Unclip the four retaining springs and carefully remove the reflector cover holding the reflector to prevent it falling from the lamp. Withdraw the reflector and place it face downward on a clean flat surface. Disconnect the three terminals of the lamp and remove the cables. Remove the bulb clamp securing screws and lift out the bulb.

17. Fit the new bulb and see the spigot on the bulb cap correctly located in the clamp. Replace the cables and check for correct colour coding. Do not overtighten the terminal nuts of the lamp or the clamp securing screws but ensure that the shakeproof washers are replaced. Fit the reflector with its cover and retaining springs.

Lens renewal

18. With the filament housing extended, remove the bulb as described at para. 16. Remove the two cable clips nearest to the bulb and withdraw the cable from the inner frame. Remove two countersunk screws and nuts which hold the lens frame and withdraw the frame complete with the lens.

19. Remove the lens clips and slide out the damaged lens. Replace with a new lens and note that, due to small variations in lens moulding, the lens clips may have to be set to suit the new lens. Replace the lens frame in the inner frame and see the shakeproof washers replaced and the nuts tight on the securing screws. Replace the flexible cable through the hole in the inner frame and secure by replacing the cable clips. Proceed then as for bulb replacement.

Front glass renewal

20. With the filament housing extended remove the reflector and the lens frame complete with lens and bulb. Remove the six countersunk screws locating the front glass retaining ring in the inner frame casting. Withdraw the retaining ring and the sealing washer. Remove the damaged front glass and clean out all sealing compound.

21. Fit the new front glass and see that the rebated rim of the glass is seated into the inner frame. Fill the space between the edge of the glass and the frame casting with sealing compound (Ref. 5CX/5085). Replace the sealing washer and secure the retaining ring to the frame casting. Replace the lens frame assembly, bulb and reflector.

Operation check

22. After servicing check all screws for tightness. With power on operate the lamp to its limits. Switch on each filament in turn and retract the lamp. See that the filament is switched off by the action of the relay switch during the final retracting movement. Check that when fully retracted the lamp housing is held rigid. If actuated in a workshop, check that when fully retracted, the spring-loaded trunnion end bracket moves between 0·05 to 0·06 in. to compress the springs, and that the relay micro switch is operated. The general chapter on landing lamps is in A.P.4343, Vol. 1, Sect. 21.

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