Chapter 25
LANDING LAMP, HARLEY, TYPE 8KD SERIES

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF APPENDICES

Introduction

1. The Harley 8KD series of 28 volt, retractable landing lamps, are principally used in helicopter aircraft. They are intended for use at relatively low speeds and should not be extended at speeds exceeding 70 knots. This chapter deals with the basic Harley 8KD landing lamp, details of individual landing lamps in the series will be found in the Appendices to this chapter. For general information on landing lamps reference should be made to A.P.4343, Vol. 1, Sect. 21.

DESCRIPTION

2. The Harley, Type 8KD landing lamp consists of the following: the outer housing, the operating mechanism, the filament housing and the filament lamp, and is illustrated in fig. 1. Individual landing lamps are illustrated in the Appendices to this chapter.

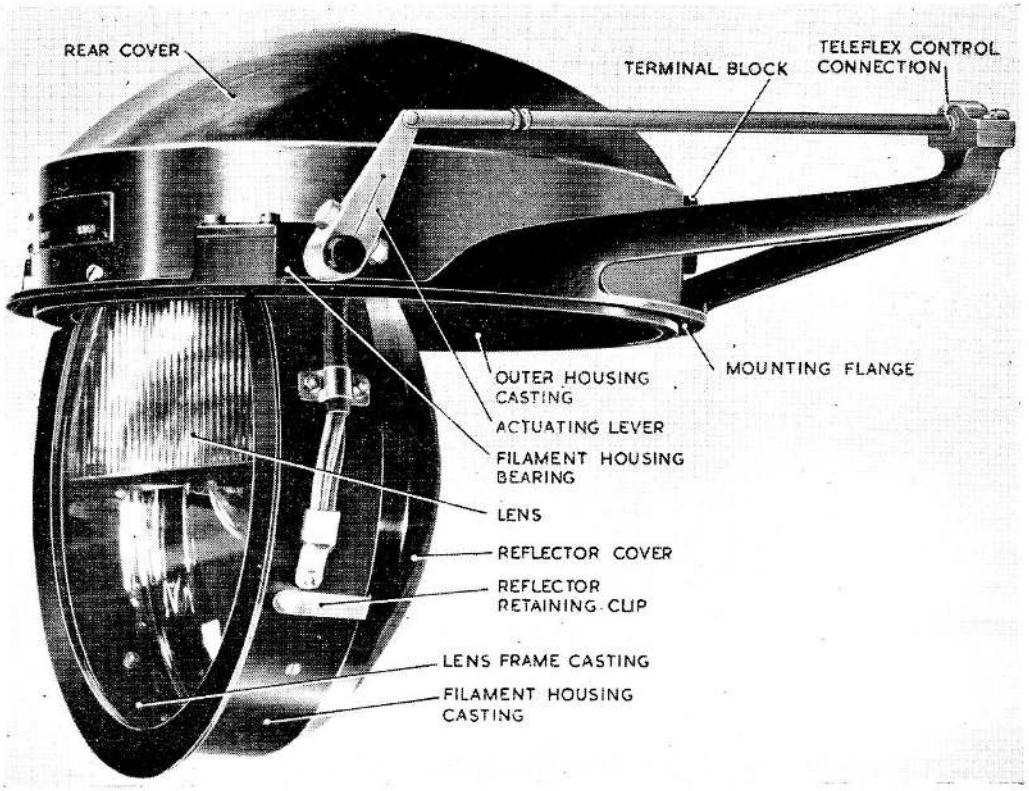


Fig. 1 Harley, Type 8KD, Landing Lamp

Outer housing

3. The outer housing is a machined casting incorporating a circular mounting flange which has eleven 4BA bolt-holes on a pitch circle of 10·75 inches, by which the landing lamp is mounted. The mounting flange carries the bearings in which the filament housing pivots, brackets to support the control assembly, and a back cover. Attached to the back cover are the terminal block and the flexible cables to the filament lamp.

Operating mechanism

4. Viewed from the front, the right hand bearing journal of the filament housing is extended to carry an actuating lever. To the outer end of this lever is pivoted the control system ; which may be either a Teleflex connection, control rod or actuator, which is supported by brackets attached to the mounting flange.

Filament housing

5. This is the moving part of the lamp and comprises an outer frame casting, lens frame, reflector and filament. The front glass beds into sealing compound and is backed with a sealing ring, the whole being held in place by the circular lens frame assembly. The lens frame assembly fits into the outer frame casting and is secured by screws, it has a horizontal cross member which carries the lamp-holder clamp. In the upper half of the lens frame assembly the lens is secured by three clips fitted with rubber pads which allow for lens expansion.

6. The lamp cap is held in a clamp secured by two, 2 B.A. screws and is accurately positioned when the locating pin on the cap fits into the hole provided in the fixed half of the clamp. The reflector fits on to the lens frame to which it is secured by three spring

clips, which bear behind the front rim of the reflector.

Filament lamp

7. The light source of the Harley, Type 8KD landing lamp has two filaments each rated at 280 watts. The main filament is at the focal point of the reflector whilst the auxiliary filament is a little to the rear and above it and produces a more dispersed beam for taxying. The filament special cap has a locating pin at the side and has three terminal studs at the rear, illustrated inset in fig. 2, coded:—

Red	...	Main filament
Yellow	...	Auxiliary filament
Blue	...	Negative

Electrical connections

8. Power supply is from a 28 volt source, through a three way, centre off position switch, permitting selection of filaments. The circuit diagram is shown in fig. 2. Connection to the lamp is made using a standard three-way 19 amp S.B.A.C. terminal block (Ref. No. 5H/2) and crimped conductor ferrules (Ref. No. 5H/9400055 or 5X/7545).

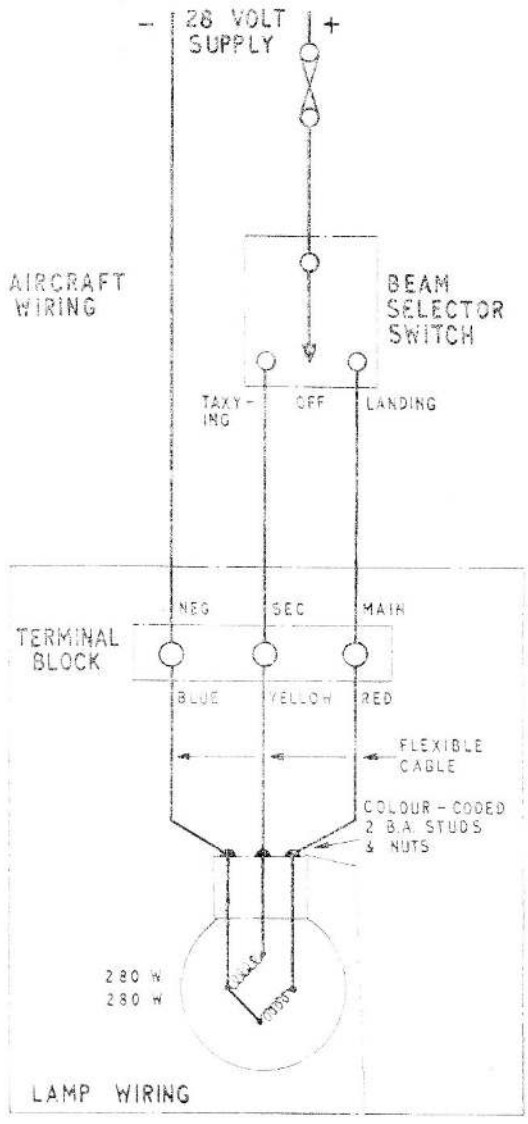
SERVICING

9. Extend the lamp to the "open" position, clean and examine the glass and lens for damage, renewing if required in accordance with instructions in para. 12 and 13. Check as much cable as is visible, especially at filament connections, for deterioration. Switch on each filament in turn for 5–10 sec. only. As the bulb cools check for smoke lines or blackening of the glass envelope, if these marks appear the filament sealing has failed, and the filament must be replaced in accordance with para. 10.

Note . . .
Time of lighting in still air for both filaments, which should not be exceeded except in cases of emergency, is 10 *minutes.*

Renewing the filament lamp

10. If a new filament is required extend the lamp fully. Unclip the three springs securing the reflector and remove the reflector, which should be placed face down on a flat surface. Disconnect the filament, unscrew the two clamping screws and remove the filament. If necessary clean the inside of the lamp housing and reflector with a clean soft cloth or



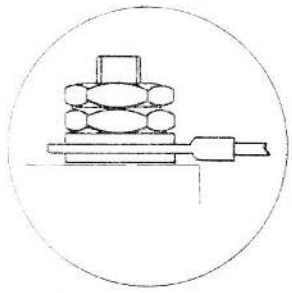


Fig. 2. Circuit diagram

chamois leather, soap and water may be used to remove any blackening or dirt, use no polish or abrasive and avoid finger-printing the reflector, front glass and lens.

11. Fit the new filament, ensure it is correctly positioned by the engagement of the locating pin, reconnect cable to the filament ensuring that the colour coding is correct and do not over-tighten the terminal nuts. Refit the reflector and secure with the three retaining clips.

Renewing the lens

12. A new lens can be fitted by dismantling as for renewing the filament and then removing the three rubber padded clips which hold the lens in place. Fit the new lens with its flat side towards the front glass and re-fit the clips ensuring that the rubber pads are in place. Then reassemble as for filament renewal.

Renewing the front glass

13. Remove the lamp from the aircraft. Remove the reflector and filament. Remove the six 4 B.A. screws securing the back cover and lift it clear of the outer housing. Remove the cable clamp immediately over the top of the top lens clip and push the cable to one side. Remove the top lens clip. Remove the two 4 B.A. screws, nuts and washers securing lens frame to the filament housing frame. Unclip the cable and draw it clear of the frame. Withdraw the lens frame complete with lens. Remove the front glass and sealing ring.

14. Clear all surplus sealing compound from inside the lamp and fit the new glass. Pack the space between the glass and the wall of the casting with sealing strips (Ref. No. 5CW/5805) replace or renew the sealing ring (Ref. No. 5CW/5063) and refit the lens frame assembly. Push the cable through the hole in the filament housing and refit cable clips. Refit the filament and reflector, ensuring the correct location of the filament. Refit the back cover and check all screws and cable for security and non-fouling.

Testing

15. After all servicing the lamp should be functionally tested by switching on each filament in turn and by extending and retracting the lamp ensuring that it functions freely and that the cable does not foul the outer housing. Should the filament housing bearings require lubricating remove the free half of the outer bearing block and apply a thin film of grease XG275 (Ref. No. 34B/222).

Insulation test

16. Using a standard 250V insulation tester, test the insulation resistance between all terminals and frame in turn, minimum permissible reading 10 megohms.

Appendix 1

LANDING LAMP, HARLEY, TYPE 8KD

LEADING PARTICULARS

Landing lamp, Harley, Type 8KD	*Ref. No. 5CX/4537*
Filament lamp (special cap) double filament, 28 volt 280/280 watts ...	*Ref. No. 5L/9959702*
Front glass	*Ref. No. 5CX/5062*
Lens	*Ref. No. 5CX/5058*
Operating unit (manual) Teleflex control assembly	*Ref. No. 5CX/5074*
Extended angle	90 *deg.*
Actuating lever travel	4·95 *in.*
Weight	7 *lb.* 8 *oz.*
Electrical connection, S.B.A.C. 3-way terminal block	*Ref. No. 5H/2*

DESCRIPTION

1. This lamp is a manually operated lamp controlled by a Teleflex (No. 2) control cable and is identical with that illustrated and described in the main chapter.

SERVICING

2. Servicing should be carried out as described in the main chapter. The servicing of the Teleflex control should be confined to examination for freedom from damage, security of attachment and free movement. Movement should be checked by extending and retracting the lamp and checking that the outer case moves freely over the inner rod. The inner rod may be lightly lubricated using grease XG–275 (Ref. No. 34B/222).

Appendix 2

LANDING LAMP, HARLEY, TYPE 8KD/1R

LEADING PARTICULARS

Landing lamp, Harley, Type 8KD/1R	*Ref. No. 5CX/5008*
Filament lamp (special cap) double filament, 28 volt, 280/280 watt ...	*Ref. No. 5L/9959702*
Front glass	*Ref. No. 5CX/5062*
Lens	*Ref. No. 5CX/5058*
Operating unit (not attached)	*optional manual or actuator*
Extended angle	90 *deg.*
Actuating lever travel	4·95 *in.*
Weight	7 *lb.* 4 *oz.*
Electrical connection, S.B.A.C. 3-way terminal block	*Ref. No. 5H/2*

DESCRIPTION

1. This lamp is similar to that described in the main chapter (shown in fig. 1) but has no operating unit attached. A remote power unit, either electrical or hydraulic, or a Teleflex control; may be connected to the actuating lever. The lamp is supplied with the control assembly brackets fitted for either left-hand or right-hand operation.

SERVICING

2. Servicing of the landing lamp is identical to that described in the main chapter.

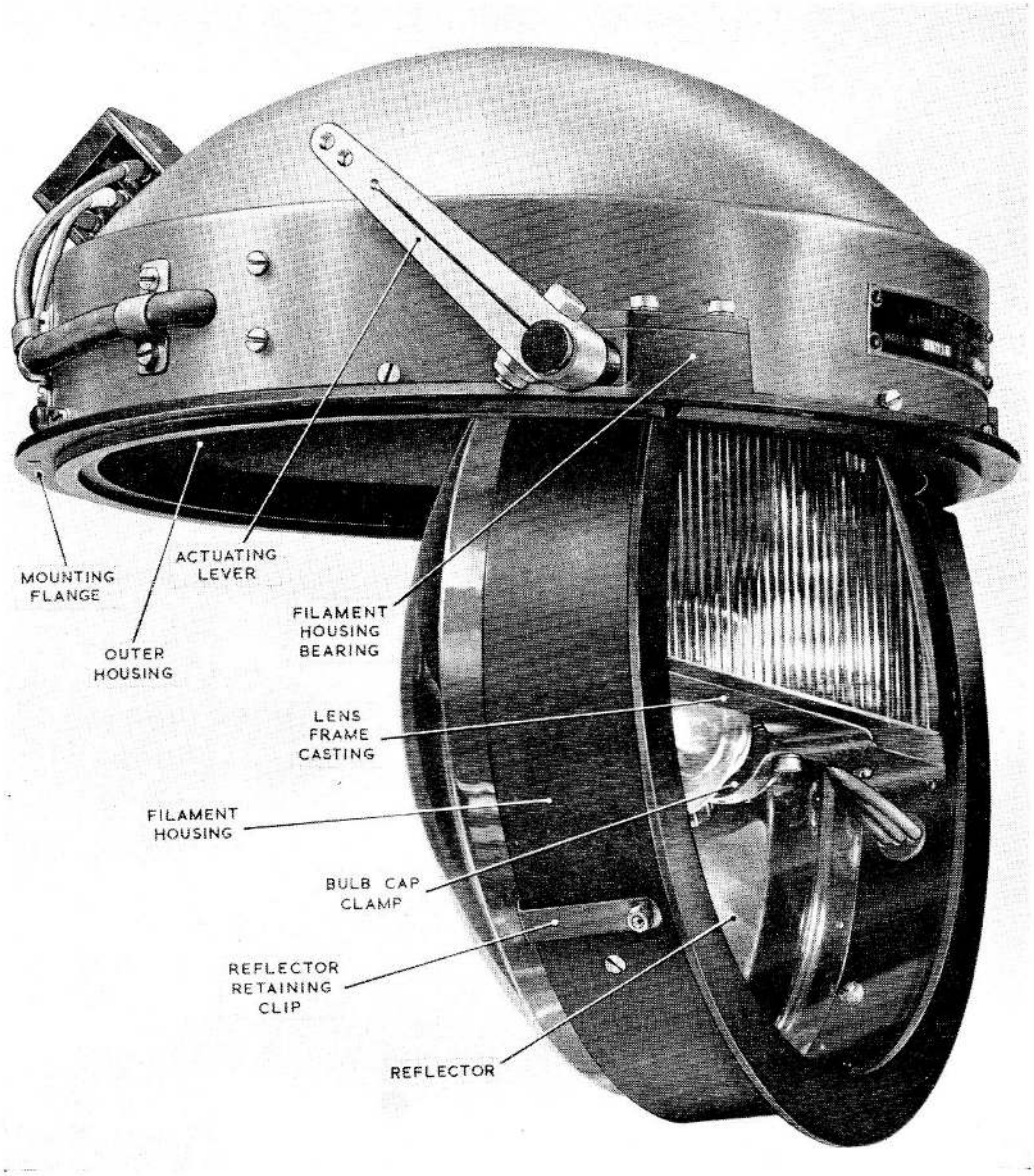


Fig. 1. Harley Landing Lamp, Type 8KD/1R

Appendix 3

LANDING LAMP, HARLEY, TYPE 8KDE

LEADING PARTICULARS

Landing lamp, Harley, Type 8KDE	*Ref. No. 5/CX5045*
Filament lamp (special cap), double filament, 28 volts, 280/280 watts ...	*Ref. No. 5L/9959702*
Front glass	*Ref. No. 5CX/5062*
Lens	*Ref. No. 5CX/5058*
Operating unit (actuator, Rotax A.0216)	*Ref. No. 5W/294*
Extended angle	90 *deg.*
Actuating lever travel	3·094 *in.*
Weight	10 *lb.* 8 *oz.*
Electrical connection S.B.A.C. 3-way, terminal block	*Ref. No. 5H/2*

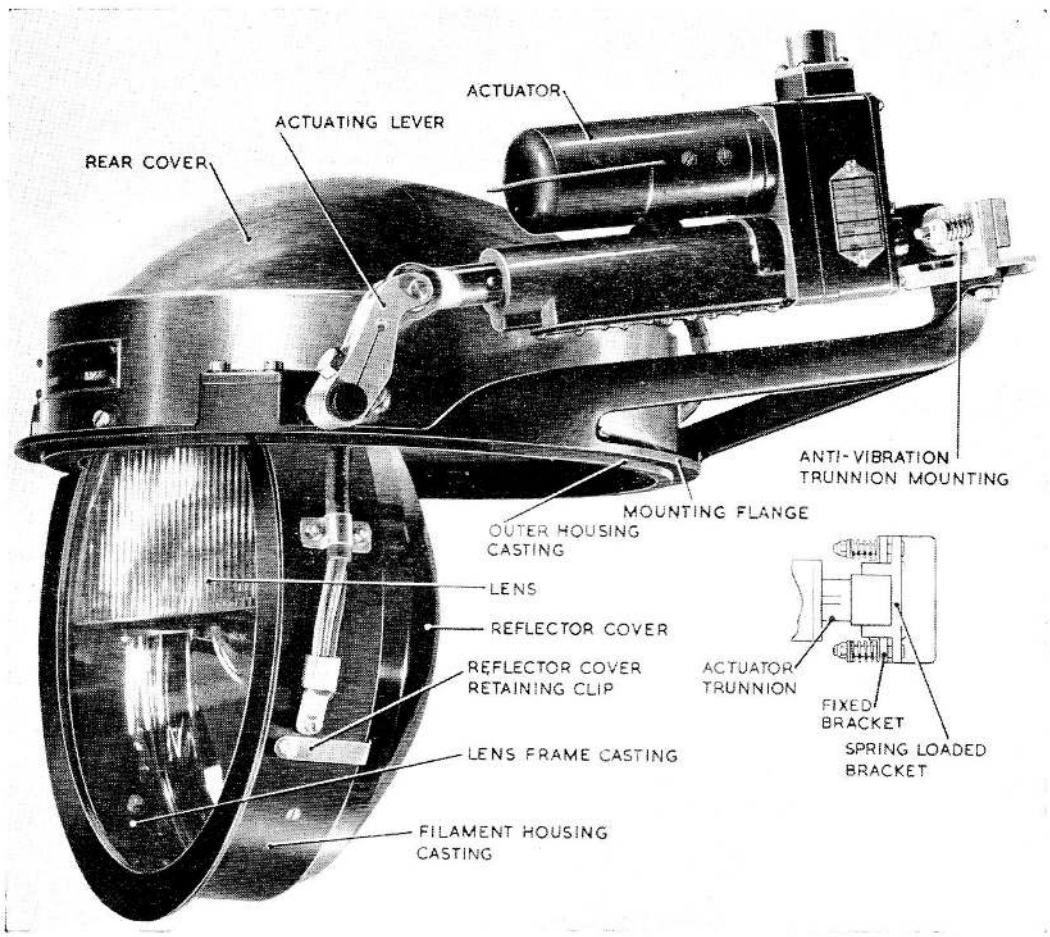


Fig.1. Landing Lamp, Harley, Type 8KDE.

DESCRIPTION

1. This lamp is similar to that described in the main chapter but has a linear actuator (Rotax A.0216) as the operating unit. Connection to the actuator is by means of a four pole plug (5X/6006) and socket (5X/6009) with pin D not used. A general view of the lamp is given in fig. 1 and a circuit diagram in fig. 2.

SERVICING

2. Servicing should be carried out as described in the main chapter. Servicing of the actuator should be carried out in accordance with A.P.4343D, Vol. 1, Book 3, Sect. 14, Chap. 3.

Renewing the actuator

3. To remove the actuator operate the lamp using a 24 volt d.c. supply, to 40 degrees open position. Remove the lever pin connecting actuator ram eye-end to actuating lever. Remove the two 2 B.A. nylon nuts compressing the springs on the actuator mounting and remove springs, washers and pin retainers; withdraw the 2 B.A. pins. Remove the actuator and mounting block. The mounting block can now be removed from the actuator by pushing out the $\frac{5}{16}$ in. parallel pin.

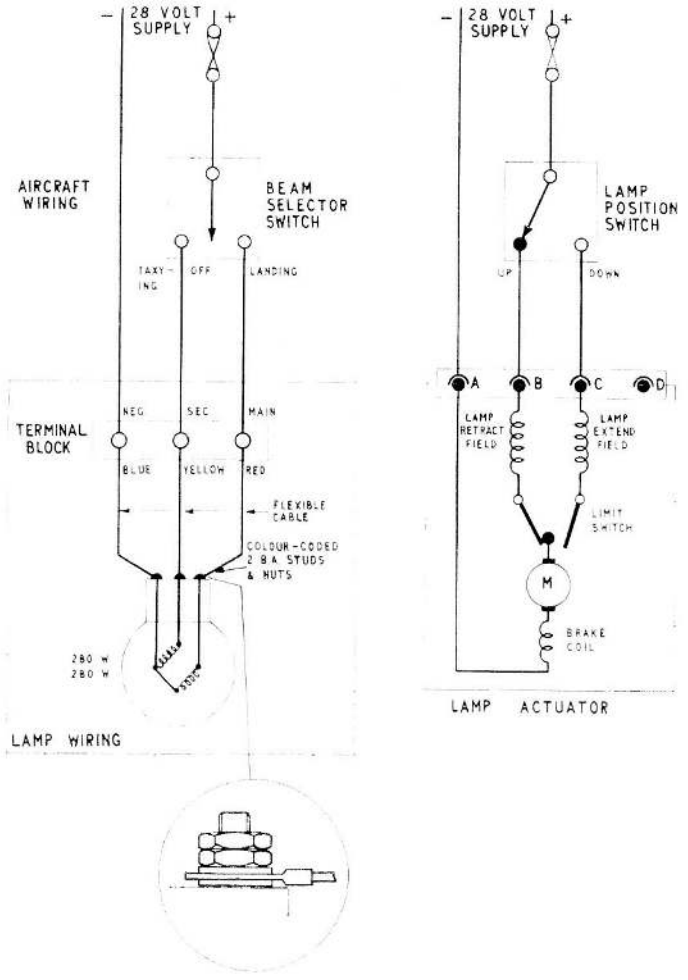


Fig. 2. Circuit diagram

4. To fit a new or serviced actuator, fully extend the actuator and fit mounting block with the $\frac{5}{16}$ in. parallel pin. Slacken off the clamping bolt of the lamp actuating lever. Fit actuator and mounting block inserting a ·090 in. spacer between the mounting block and the mounting bracket. Refit the 2 B.A. pins, pin retainers, washers and springs and secure with two 2 B.A. nylon nuts. Tighten down until the springs are compressed to a length of $\frac{17}{32}$ in. Refit the lever pin connecting ram eye-end to actuating lever, position the actuating lever so that the actuator clears the back cover with the filament housing pushed tight home into the outer-housing. Tighten the actuating-lever clamping bolt.

5. Retract the actuator until the lamp is approximately 40 degrees open and remove the ·090 in. spacers; extend the actuator until the lamp is fully closed and check that the gap between mounting block and mounting bracket is now ·030/·040 in. Fully open the lamp and check that the opening angle is 90 degrees, functionally operate the lamp a number of times and check that no fouling occurs and actuator travel limits are correct.

Appendix 4

LANDING LAMPS, HARLEY, TYPE 8KDE/W AND TYPE 8KDE/WR

LEADING PARTICULARS

Landing lamp, Harley, Type 8KDE/W	*Ref. No. 5CX/*
Landing lamp, Harley, Type 8KDE/WR	*Ref. No. 5CX/*
Filament lamp, (special cap), double filament, 28 volts 280/280 watts ...	*Ref. No. 5L/9959702*
Front glass	*Ref. No. 5CX/5062*
Lens, Part No. D309	*Ref. No. 5CX/*
Operating unit (actuator, Plessey, CZ53681/11C) ...	*Ref. No. 5W/2836*
Extended angle	90 *deg.*
Actuating lever travel	3·00 *inches*
Weight	8 *lb.* 4 *oz.*
Electrical connection, Harley 3-way terminal block, Part No. WB1114/S/3B/1 ...	*Ref. No. 5CX/*

DESCRIPTION

1. This lamp is similar to that described in the main chapter but has a linear actuator (*fig.* 1) fitted as the operating unit and a light-weight lens. Connection to the actuator is by means of a six pole, miniature Mk. 4 plug (Ref. No. 10H/0560080) and socket (Ref. No. 10H/0560120) in which pin F is not used, a circuit diagram is given in fig. 2.

2. The lamps are supplied for left-hand and right-hand application, 8KDE/W and 8KDE/WR respectively, otherwise they are identical.

SERVICING

3. Servicing should be carried out as described in the main chapter. Servicing of the actuator should be carried out in accordance with A.P.4343D, Vol. 1, Book 3, Sect. 14, Chap. 43.

Renewing the actuator

4. To remove the actuator, operate the lamp using a 24 volt d.c. supply, to 40 degrees open position. Remove the lever pin connecting the actuator ram eye-end to the actuating lever. Remove the two 2 B.A. nylon nuts compressing the springs on the actuator mounting and remove springs, washers and pin retainers; withdraw the 2 B.A. pins. The mounting block can now be removed from the actuator by pushing out the $\frac{5}{16}$ in. parallel pin.

5. To fit new or serviced actuator fully extend the actuator and fit mounting block with the $\frac{5}{16}$ in. parallel pin. Slacken off the clamping bolt securing the lamp actuating lever. Replace the actuator and mounting block inserting a ·090 in. spacer between the mounting block and mounting bracket. Refit the two 2 B.A. pins, pin retainers, washers and springs and secure them with two 2 B.A. nylon nuts. Tighten down until the springs are compressed to a length of $\frac{17}{32}$ in. Refit the lever pin connecting ram eye-end and actuating lever, position the actuating lever so that the actuator clears the back cover with the lamp filament housing pushed tight home into the outer housing. Tighten the actuating-lever clamping bolt.

6. Retract the actuator until the lamp is approximately 40 degrees open, remove the ·090 in. spacer; extend the actuator until the lamp is fully closed and check that the gap between mounting block and mounting bracket is now ·030/·040 in. Fully open the lamp and check that the open angle is 90 degrees, functionally operate the lamp a number of times and check that no fouling occurs and that actuator travel limits are correct.

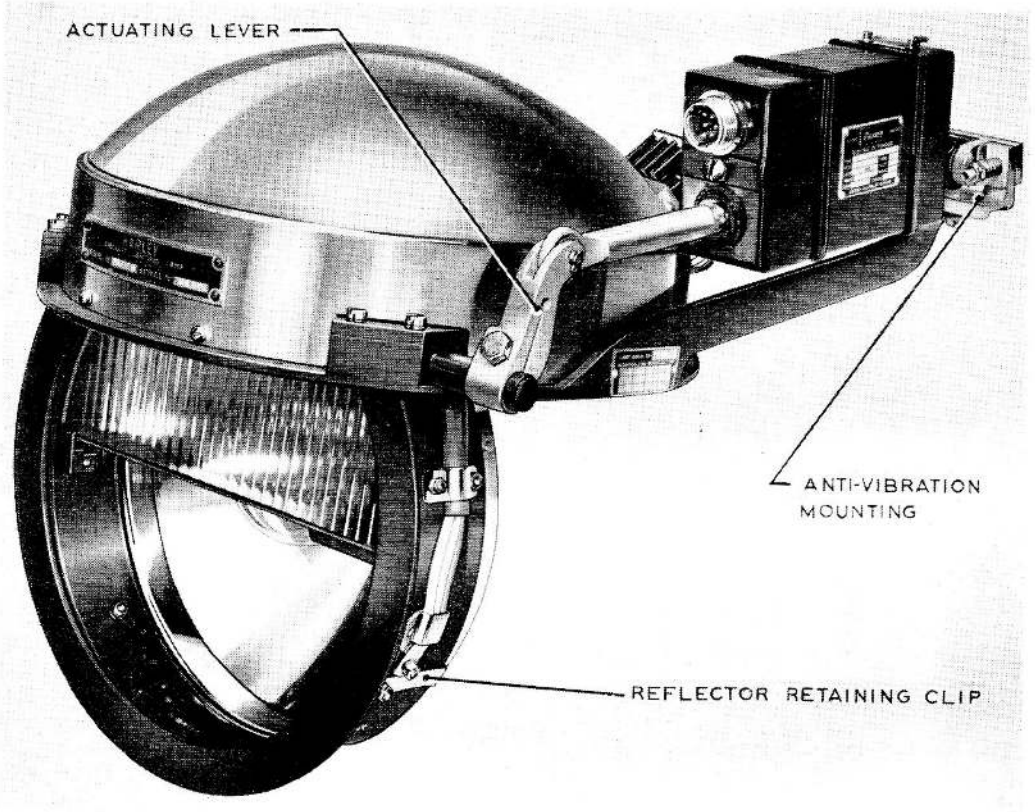


Fig. 1. Harley Landing Lamp, Type 8KDE/W

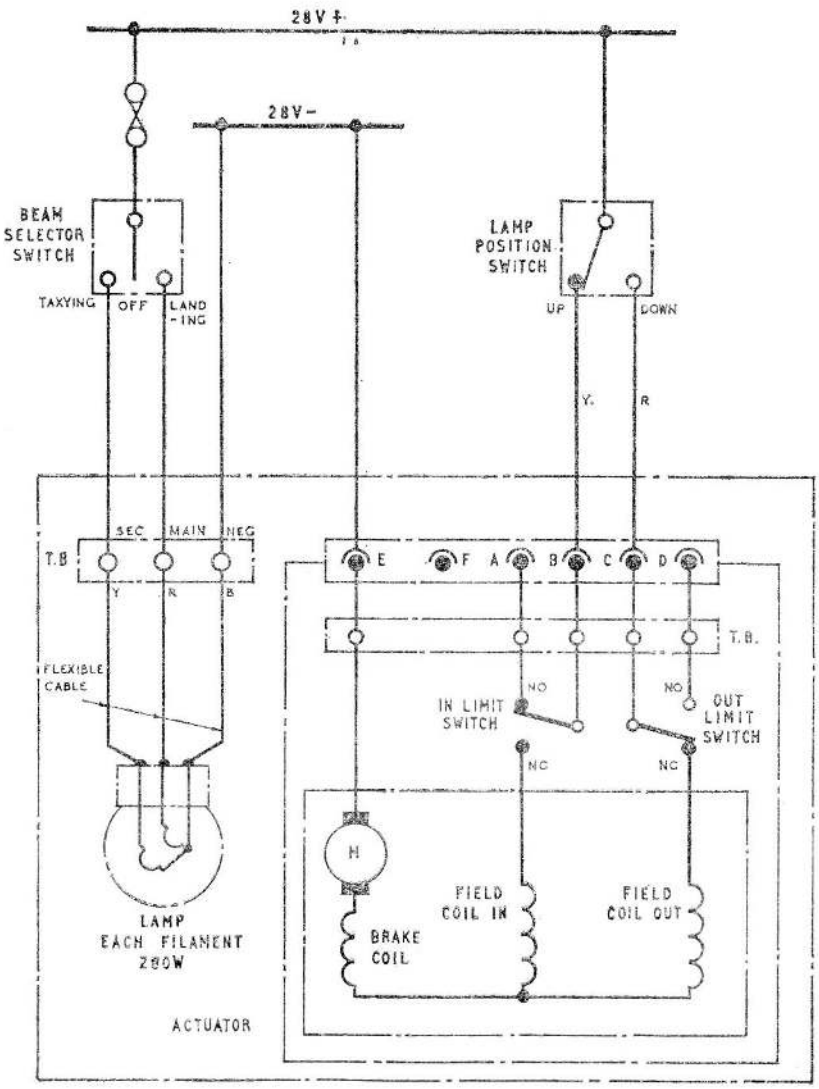


Fig. 2. Circuit Diagram