

## Chapter 4

### LANDING LAMP, TYPE K

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#### LEADING PARTICULARS

Landing lamp, Type K ... ..	Stores Ref. 5CX/2052
Lamp, filament, 350 watts ... ..	Stores Ref. 5L/X956705
Operating unit ... ..	Stores Ref. 5UD/1517
Mounting rig, Type B ... ..	Stores Ref. 5CX/4072
Front glass ... ..	Stores Ref. 5CX/2058
Weight ... ..	6.5 lb.
Overall depth, outer housing ... ..	6.25 in.

#### Introduction

1. The Type K landing lamp is in general use in military aircraft and is virtually a larger version of the Type J. It is electrically operated and beam selection for landing or taxiing is by the use of alternative "out limit" switches. It is designed for operation at air speeds up to 140 knots. It contains three main assemblies, viz., the outer housing, the operating mechanism and the retractable, filament housing.

#### DESCRIPTION

##### Outer housing

2. This is a fabricated coned unit having a flanged rim which, when held between the plates of the mounting rig, carries the weight

of the lamp in the aircraft. The base casting of the operating mechanism is secured to the side of the outer housing by eight screws.

##### Mounting rig

3. This consists of two metal plates, secured together by screws, between which is clamped the flanged rim of the outer housing. The larger plate fits behind the rim and is fixed to the airframe structure. The smaller, front plate has a circular hole through which the retractable filament housing operates. A scale is engraved round a short length of the periphery of this hole. The mounting rig is a separate assembly and is not normally supplied with the landing lamp.

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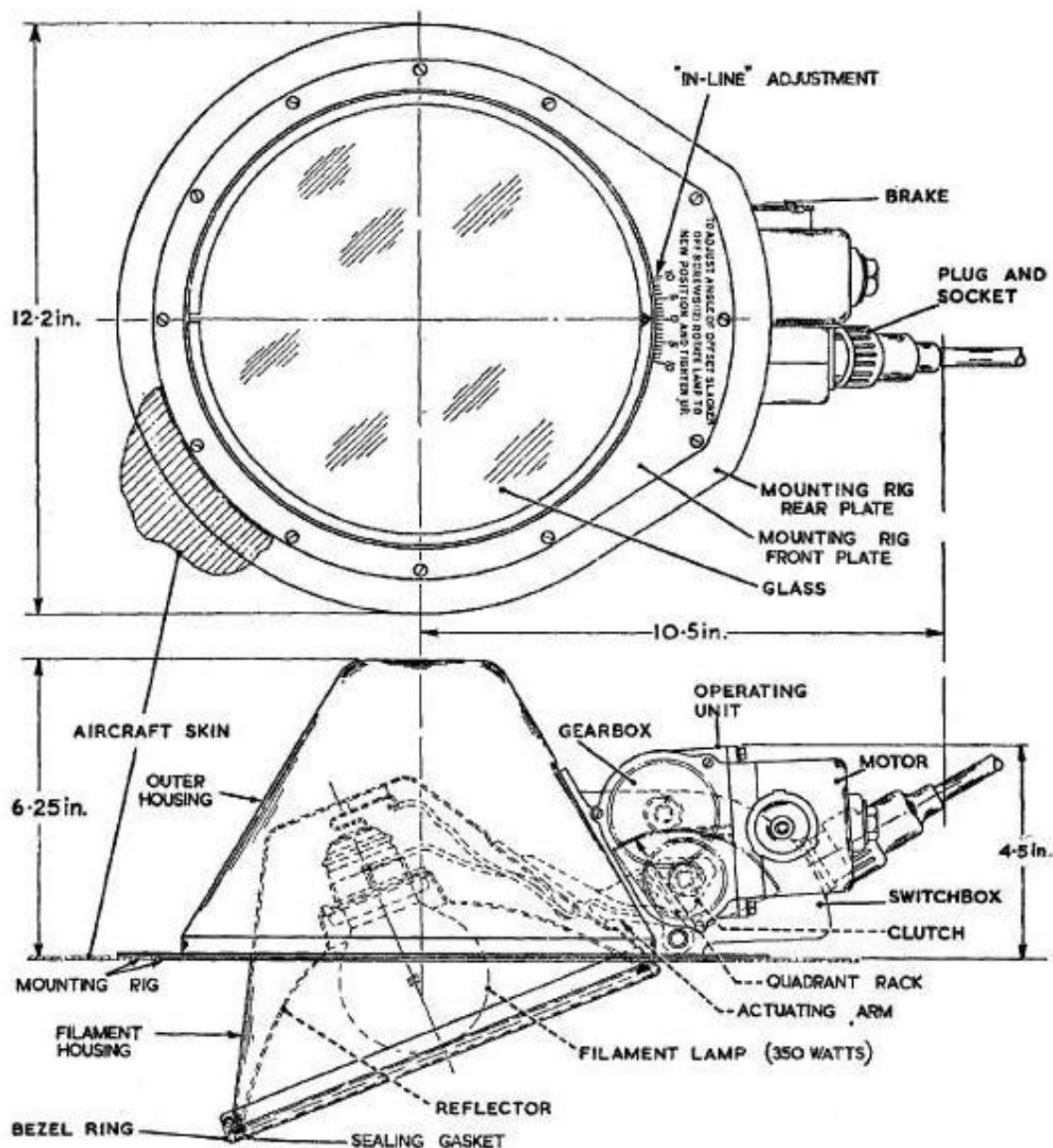


Fig. 1. Type K landing lamp

**Beam "in-line" adjustment**

4. An index mark, on the bezel ring of the front glass, registers against the scale on the mounting rig front plate. The lamp may be rotated in the mounting rig when the twelve clamping screws are slackened. This permits adjustment of the beam 10 deg either side of the fore-and-aft line of the aircraft.

**Operating mechanism**

5. The operating unit for the Type K landing lamp is fully described at Chap. 21 of

AP.4343D, Vol. 1, Sect. 16. It has an alternative field, reversible, series motor driving into an adjustable, spring loaded, clutch. This clutch is set to slip when the air pressure at the centre of the lamp glass reaches 35 lb. (approx. 140 knots airspeed). The motor operation is rendered deadbeat by the electro-magnetic brake which is energized in series with the motor.

6. The motor, driving through reduction gearing, operates a rack and pinion quadrant

to which is secured the actuating arm carrying the filament housing. The quadrant spindle extends into the switchbox where it carries an arm moving over a contact which forms a switch in series with the filament. The actuating arm has a channel through which flexible leads pass from the switchbox to the bulb holder.

#### Switchbox (fig. 2)

7. The moving arm in the switchbox does not complete the filament bulb circuit until

the filament housing is approximately half extended. This arm also operates three limit switches, one at the fully retracted position and two for the "high" and "low" extended positions. The settings of the limit switches are adjustable within the switchbox.

#### Adjusting "high" beam

8. Remove the cover of the switchbox and slacken the screws marked "A" in fig. 2. Slide the insulated base of the "out" limit switches to the new position and tighten the

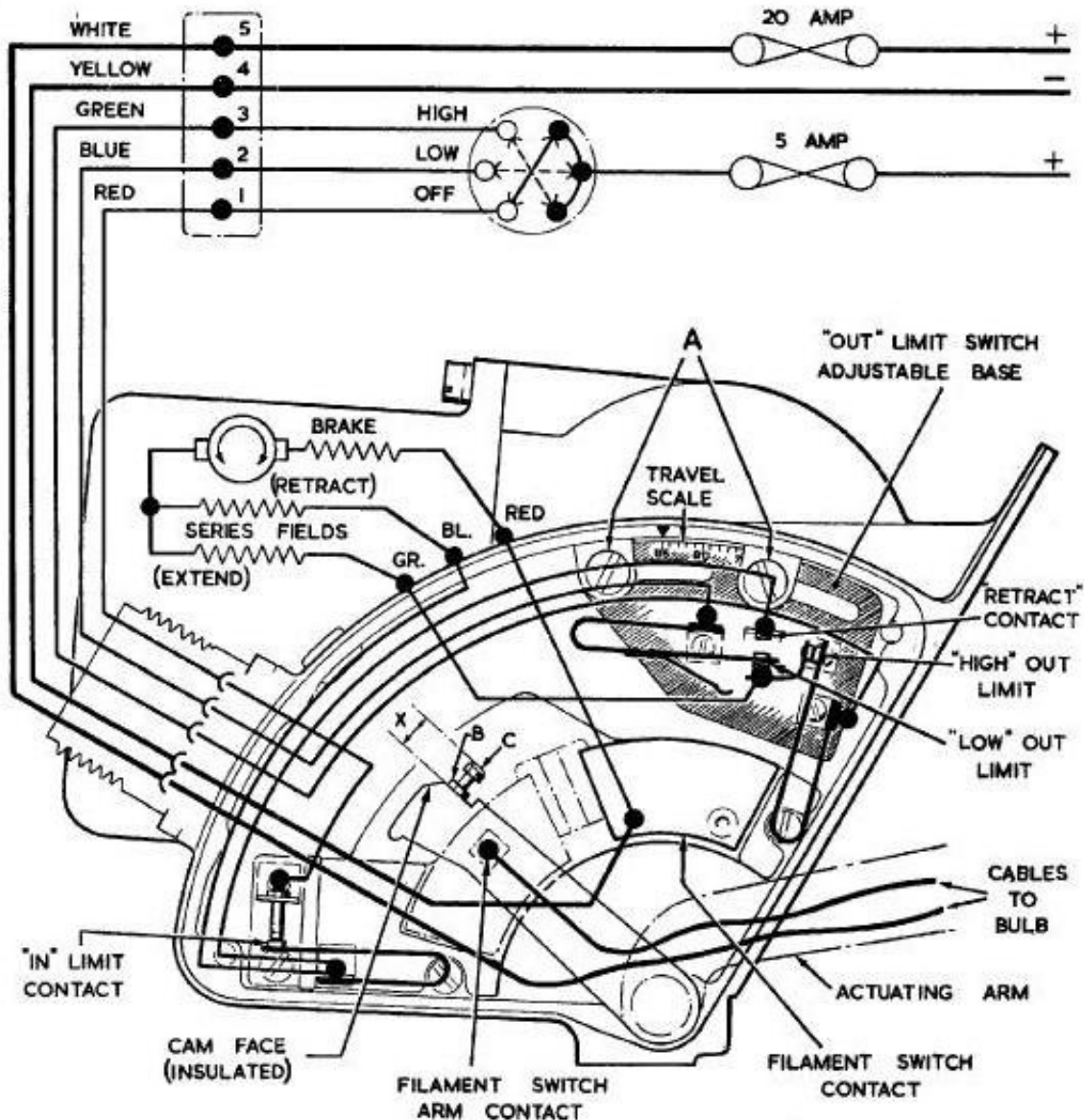


Fig. 2. Switchbox adjustments and circuit diagram

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securing screws. The index mark against the scale on this insulated base indicates the TOTAL travel of the filament housing, in degrees, from the retracted position, when the dimension "X" is 0.25 in.

#### Adjusting "low" beam

9. The dimension "X," i.e., the length of the striker pin, is initially set to 0.25 in. which corresponds to a difference of 7 deg. between the "high" and "low" positions of the beam. A change of  $\frac{1}{32}$  in. of the dimension "X" corresponds to 1 deg. movement of the beam. Adjustment can be made by slackening the lock-nut "B" and moving the striker pin "C" as required.

10. It should be noted that any alteration of the angular difference between "high" and "low" beam positions will cause a similar alteration to the total travel of the lamp housing. Thus, if the "low" beam position has been altered some adjustments of the insulated base (*para.* 7) may be necessary if the "high" beam position is to remain unaltered.

11. In some modern aircraft the angular movement of the beam between the landing and taxiing positions is less than 5 deg. The striker pin adjustment range is from 5 deg. to 9 deg. In these aircraft therefore it may be necessary to remove the striker pin and replace it by a round head screw, 8 B.A., 0.75 in. long.

#### Filament housing

12. The filament housing is a fabricated cone having a flanged rim into which are fitted the front glass and the rim of the reflector. At the apex of the cone is fitted a spring contact which bears on the centre contact of the filament lamp cap. The front glass, with its sealing ring, is secured by a bezel ring which locates on a small bracket. The complete housing is held by six screws and nuts to the casting of the actuating arm.

#### Reflector and bulb holder

13. The reflector is located in the rim of the filament housing and is secured by two screws and nuts. At its centre the bulb holder is fitted. A clamp fitting round the bulb holder forms the electrical connection to the body of the lamp cap. The front of the bulb holder is slotted to correspond with the flange of the bulb cap and so assures correct positioning of replacement bulbs.

#### Filament lamp

14. The light source for this lamp is a single, coiled coil, gas filled 350-watts filament bulb. The location of the filament relative to the bulb cap is made within fine limits to ensure correct focusing when bulbs are renewed. The bulb has a large prefocus cap, the flange of which ensures that it can be inserted in the holder in the correct position only.

#### Electrical connections (fig. 2)

15. The control and filament circuits of the lamp are fed from the 28V source and connected through a Type M, six-pole, 7 amp socket (Ref. 5X/766) at the lamp switchbox. The control circuit, fed from a 5 amp. fuse, is taken through a three-position switch. These positions are OFF, for housing the lamp, LOW and HIGH for extending the lamp and permitting selection of "landing" or "taxiing" beam. The filament circuit has a separate 20 amp. fused supply and is not completed until the switch arm has moved to approximately the half extended position.

#### Operation

16. Selection of LOW at the control switch completes a circuit through the "low" limit switch, the "extend" field of the motor and the brake. The lamp housing will move until the switch-arm causes the "low" limit switch to open and at the same time close a contact in the "retract" field circuit. If further out movement of the lamp is required, i.e., HIGH is selected, the "extend" field circuit is completed through the "high" limit switch.

17. Should the LOW position be again selected the "retract" field circuit is completed through the "retract" contact of the "low" limit switch. The motor now reverses direction of drive and the lamp housing retracts until the low limit switch "retract" contacts open. If full retraction is required, i.e., OFF is selected, the motor "retract" field is energized through the "in" limit switch which is mechanically operated by the switch arm, to break this circuit when the lamp housing is fully retracted.

#### SERVICING

##### Renewing the filament bulb

18. Examine the bulb for signs of blackening or white streaks on the glass. If a new bulb is required, actuate the lamp to the fully

extended position. Unclamp the front glass bezel by removing the clamping screw which locates through a bracket on the lamp housing. Lift out the front glass and its sealing gasket. Remove the old and fit the new bulb (Ref. 5L/X954717).

**19.** Clean the reflector and front glass using a soft, clean cloth. If necessary use soapy water to remove dirt. Avoid finger printing the bulb, reflector and front glass and do not use any polish for cleaning.

#### **Renewing a front glass**

**20.** Proceed as for renewing a bulb. Remove all broken glass and fit the new front glass (Ref. 5CX/2058) with its sealing gasket (Ref. 5CX/5131), renewing this gasket if necessary. Replace the bezel ring and secure it to the bracket provided.

#### **General**

**21.** If the landing lamp is removed from the aircraft, the switchbox cover may be removed and the switches examined for cleanliness. If necessary, clean the limit switch contacts but do not alter the adjustments. The contact over which the moving arm wipes should be cleaned with a cloth moistened with white spirit.

**22.** The operating unit gearing should not normally require lubrication nor the clutch require adjustment, except after stripping at fourth line servicing.

**23.** After servicing in the aircraft, check all screws for security. Actuate the lamp to its alternative extended positions and see that the filament glows. Do not leave the lamp switched on in still air for long periods, because the heat generated will adversely affect the efficiency and length of life of the bulb. The general chapter on landing lamps is in A.P.4343, Vol. 1, Sect. 21.

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