Chapter I

LANDING LAMP, ROTAX, TYPE H2601/1

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Stores Ref.	5C/4010
Lamp, double filament, 22V, 350W, Stores Ref.	5L/600
Retracted position	Flush with under surface of aircraft skin
Extended position	73 to 87 deg. from retracted position
Retraction time	5·5 seconds
Azimuth adjustment	16 deg.
Lamp diameter	9 in.
Weight	5·5 lb.

Fig. 1. General view (part section)

DESCRIPTION

General

1. The landing lamp Type H.2601/1 is a motor operated retractable lamp designed for installation in the undersurface of the mainplane of the aircraft. A double filament lamp bulb is fitted, which is wired through a two way change-over switch, thus enabling either filament to be used.

2. The lamp (*fig.* 1) is constructed in two major units, namely :—

(1) The driving motor, gearbox, switch-box, and outer shell.

(2) The lamp casing, bulb holder, reflector, and front glass assembly.

Motor unit

3. The motor unit is of two pole split series field design, and is secured to a mounting plate by a centralizing spigot and two screws. The mounting plate is then pinned and screwed to the gearbox.

4. The split field enables the motor to run in either direction and is controlled by a three position selector switch mounted in the aircraft cockpit. This switch is marked IN, OFF, and OUT. The motor is automatically stopped by limit switches when the lamp reaches either the fully retracted or extended positions.

5. To ensure the minimum amount of overrun to the motor when the selector switch is turned to OFF, or when the lamp has reached the limits of travel, a small spring loaded electromagnetic brake is mounted at the commutator end of the motor.

6. The brake solenoid is connected in series with the motor field. With no current flowing the brake plunger is held, by spring pressure, against a brake disc secured to the motor armature shaft, thereby preventing the armature from rotating. When the motor field is energized, the brake solenoid releases the brake plunger and allows the motor shaft to rotate.

7. The brake also prevents the lamp, when fully extended, from creeping due to wind pressure acting upon the lamp glass.

8. The travel of the brake solenoid plunger may be adjusted by either removing or inserting shims between the motor housing and the brake coil assembly. The motor brush gear and brake assembly is protected by a cover retained by a spring clip.

9. A pinion, pinned to the driving end of the motor shaft protrudes through the motor mounting plate into the gearbox.

Gearbox

10. The gearbox unit consists of a light alloy, box shaped casting to which is secured the motor mounting plate. The gearing consists of a 5-stage spur gear train, providing a reduction from the motor shaft to the quadrant gear of 4770 to 1. The gear shafts are supported in phosphor-bronze Oilite type bearings housed in the motor mounting plate and the gearbox casting.

Switchbox unit

11. This unit also consists of a light alloy casting divided into two compartments. One compartment contains the final drive to the lamp quadrant gear, and also forms the recess into which the quadrant gear is housed with the lamp retracted. The other compartment contains the limit switches and terminal block. The gearbox is secured to this casting by four screws.

12. The switch compartment contains three switches ; two of these are the " in " and " out " limit switches, and the third is the lamp filament switch. Each switch is operated by a double-armed toggle lever which engages with a cam riveted to the quadrant gear.

13. The switches are mounted upon adjustable plates ; the " out " limit switch and lamp filament switch are mounted together on a single plate, and the " in " limit switch is mounted separately. This allows a maximum of 12 deg. adjustment between the retracted and extended positions, i.e., 73 to 85 deg. fully extended. The lamp switch is pre-set to " make " a few degrees before the out switch is broken.

14. The 5-way terminal block is accommodated within the switch compartment. A metal cover plate is screwed to the switch compartment, but access to the terminal

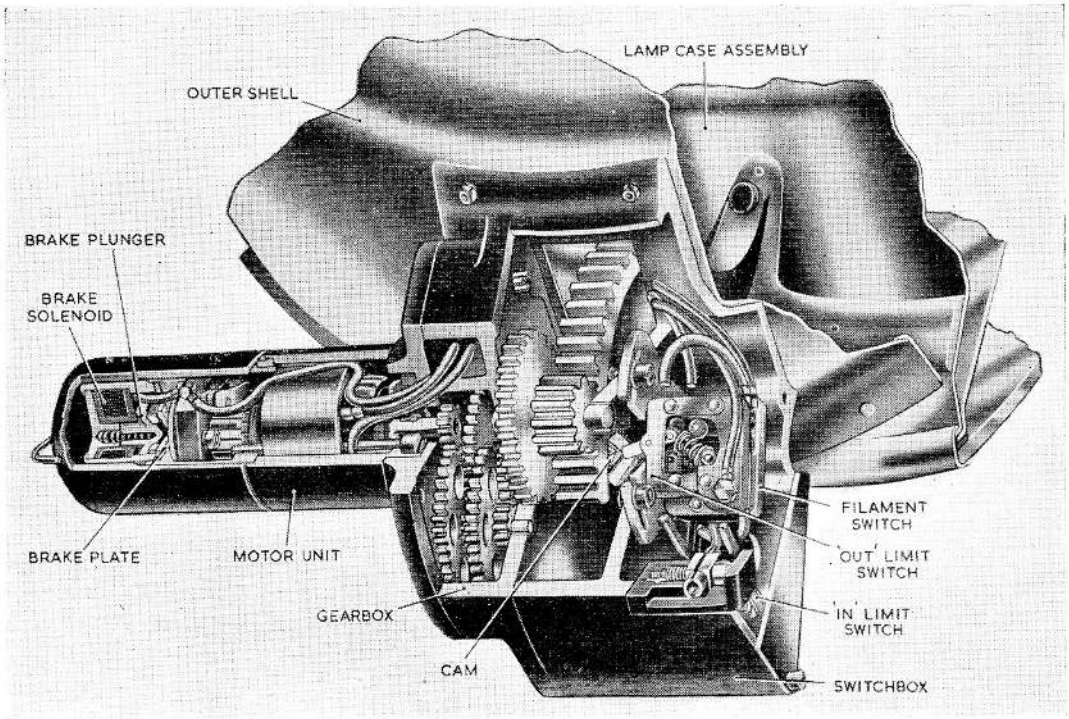

Fig. 2. Sectional view

connections within the terminal block is obtained via a separate cover plate protruding through a recess cut into the switchbox cover.

Lamp case assembly

15. The lamp case assembly, which includes the bulb holder, reflector, and glass, is riveted to the quadrant gear casting. The quadrant gear is secured to the gearbox and switchbox castings by a pivot bolt. This bolt passes through both components and a bearing in the quadrant gear, thus permitting the lamp case assembly to pivot and retract within the outer shell, and the quadrant to mesh with the final drive gear.

16. The bulb holder assembly is adjustable within the lamp case ; it is pre-set and locked by a clamp ring to give correct focusing. The complete assembly is protected by a rubber cover.

17. A double filament 350 watt, 22-volt bulb is fitted, so that in the event of main filament failure occurring during use, the second filament may be selected by operation of the emergency switch.

Note . . .

A bulb with one filament only available for service, must be replaced as soon as possible with a new and tested item.

18. The reflector is secured within the lamp case by a small lip around its periphery ; this lip is clamped between the front glass gasket and the lamp case. The lamp glass and bulb must first be removed to release the reflector.

19. The front glass and reflector assembly is secured to the lamp case by a clamp ring and two draw screws. It is essential to ensure that when fitting the clamping ring the draw screws are positioned diametrically opposite the lamp pivot, so that they locate correctly within the cut-away portion of the lamp mounting ring when the lamp is retracted. A gasket is fitted between the glass and the reflector, and a domed lamp shield is permanently secured to the centre of the glass.

Outer shell

20. The outer shell is secured to the gearbox and switchbox castings by eight screws.

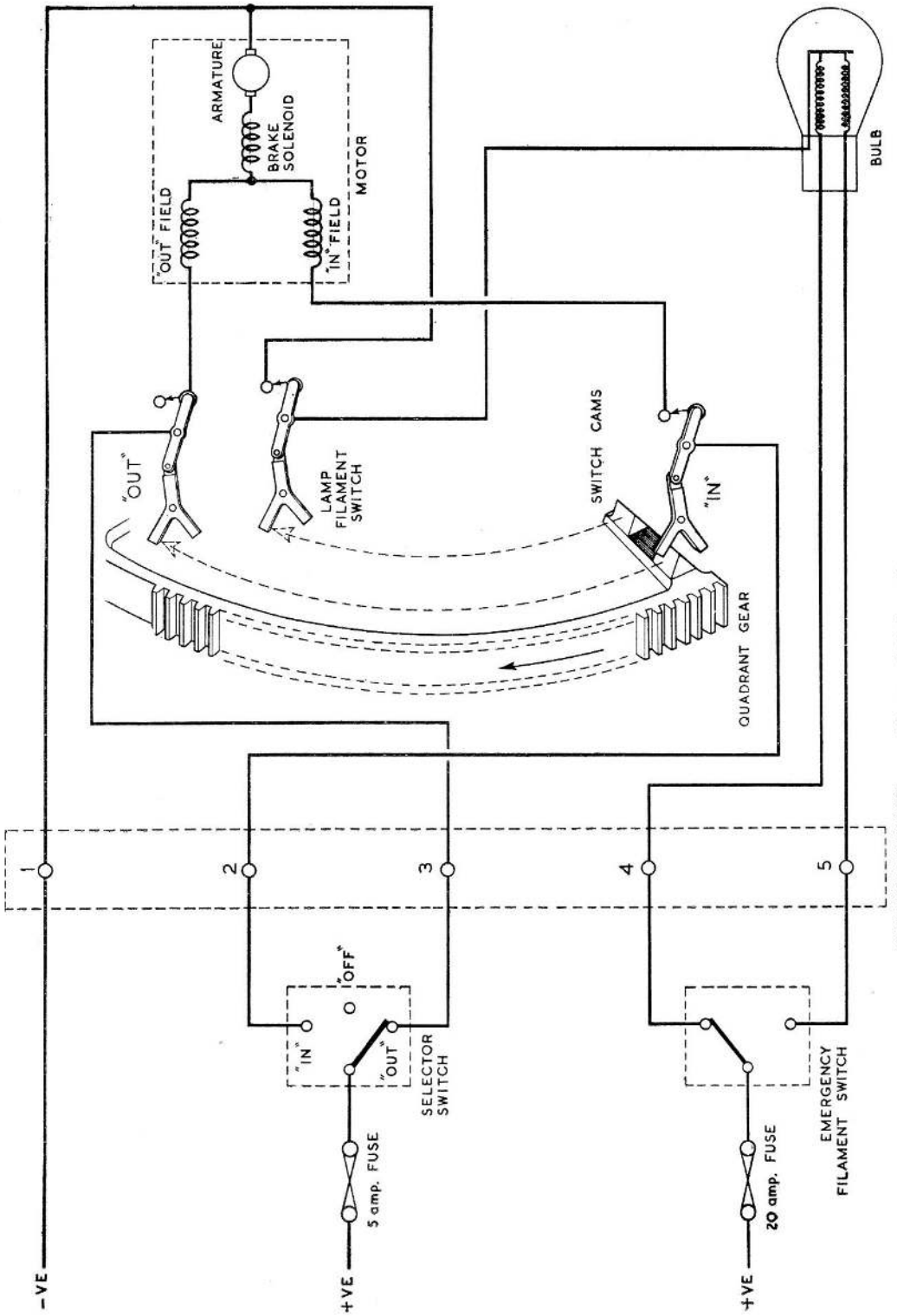

Fig. 3. Wiring diagram

The shell forms the recess into which the lamp case assembly retracts, and a lip around the periphery of the shell is located between the aircraft skin and a clamping or mounting ring secured by 17 bolts.

21. The lamp may be adjusted in azimuth approximately 16 deg. (8 deg. either side of zero), by loosening the 17 bolts and turning the complete lamp assembly.

OPERATION

22. With the lamp fully retracted and the selector switch in the OFF position only the " out " limit switch is made, and therefore with no current in circuit the motor armature is braked.

23. With a 24-volt d.c. supply connected, and the selector switch set to OUT (*fig.* 3), the " out " field coils of the motor and brake solenoid coil will be energized, thus allowing the armature to rotate and move the lamp towards the extended position.

24. As soon as the lamp has left the fully retracted position, the " in " limit switch will close (but does not complete circuit). A few degrees before the lamp reaches the fully extended position the lamp filament switch is made, and upon attaining the fully extended position the quadrant cam opens the " out " limit switch, thereby automatically switching off the motor and applying the brake.

25. To retract the lamp, the selector switch is set to IN. This completes the circuit through the " in " limit switch, motor field, and brake solenoid.

SERVICING

26. When night flying is intended, or when authorized, the following checks should be made.

27. If it is necessary to renew a lamp bulb or clean the reflector, care must be taken to prevent the reflector from falling when the bulb is removed from the holder. Handle the reflector carefully with a clean soft cloth to prevent finger marks soiling the highly polished surface. Clean the reflector with cotton wool and soapy water only.

Note . . .

Ensure that the front glass clamping ring is replaced correctly, i.e., the two draw screws must be diametrically opposite the lamp pivot.

28. The lamp should be extended and retracted two or three times to ensure correct functioning. With the lamp in the fully extended position the filament change-over switch should be operated to test both filaments.

29. Retract the lamp a few degrees from the fully extended position until the bulb circuit is broken ; this will enable the cable connections to the bulb holder to be examined for cleanliness and security.

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