

CHAPTER

33

LIGHTS

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GENERAL

The internal lighting of airplane consists of cockpit floodlight, placard and instrument illumination and auxiliary lamp.

The external airplane lighting incorporates position (navigation) lights, strobe lights (optional), taxi and landing lights and anti-collision beacon.

EFFECTIVITY: All

33-00-00

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INTERNAL LIGHTING

DESCRIPTION AND OPERATION

COCKPIT ILLUMINATION

The cockpit illumination is ensured by ceiling floodlight located upon fixed cockpit canopy. The lamp is controlled by switch inbuild in the lamp body. The lamp is fed directly from the battery bus bar and it is no necessary to **MASTER SWITCH** and **BATTERY** switches before its use.

Wiring diagram of cockpit illumination is issued in subsection 91-31-00.

PLACARD AND INSTRUMENT ILLUMINATION

The placard and instrument illumination is controlled by LIGHTING switch. The individual section of instrument illumination may be dimmed by three controllers (potentiometers). The instrument dimming controllers are located in console under the instrument panel.

The wiring diagram of placard and instrument illumination dimming control is issued in subsection 91-30-00. The wiring diagram of instrument illumination is issued in Chapter 95 (SUPPLEMENTS).

AUXILIARY LAMP

The auxiliary lamp is in case of power supply failure fed from emergency electric power source (section 33-50-00).

REPAIRS

Fault	Possible reason	Remedy
The ceiling floodlight upon the fixed canopy is unserviceable.	Cut bulb filament.	Check bulb filament visually or by ohmmeter and replace faulty bulb
	Cut INT. LIGHT 1A fuse. (Up to S/N 0045 incl.).	Detect reason and replace fuse.
	INT. LIGHT circuit breaker is OFF (From S/N 0046 incl.).	Detect reason and circuit breaker ON.
	Short circuit (Fig. 91-5, Item C59).	Remove short circuit and repair or replace defective parts.
	Cut electric circuit.	Check circuit by ohmmeter and repair or replace defective parts.
	Faulty switch lamp.	Replace ceiling floodlight.
Illumination of some placard is unserviceable.	Cut electric circuit (Fig. 91-4).	Check circuit by ohmmeter and repair or replace defective parts. Replace cur conductors.
	Cut bulb filament.	Check bulb filament visually or by ohmmeter and replace faulty bulb.
Placard illumination is unserviceable.	Cut PLACARDS 1A fuse (Up to S/N 0045 incl.).	Detect reason and replace fuse.
	PLACARDS circuit breaker is OFF (From S/N 0046 incl.).	Detect reason and circuit breaker ON.
	Short circuit (Fig. 91-4).	Remove short circuit and repair or replace defective parts.
	Cut electric circuit.	Check circuit by ohmmeter and repair or replace defective parts. Replace cur conductors.
Illumination of some instrument is unserviceable.	Cut electric circuit.	Check circuit by ohmmeter and repair or replace defective parts. Replace cur conductors.
	Cut bulb filament.	Check bulb filament visually or by ohmmeter and replace faulty bulb.
Instruments illumination is unserviceable.	Cut INST. LGT 3,15A (Up to S/N 0045 incl.).	Detect reason and replace fuse.
	INST. LGT circuit breaker is OFF (From S/N 0046 incl.).	Detect reason and circuit breaker ON.
	Short circuit.	Remove short circuit and repair or replace defective parts.
	Cut electric circuit.	Check circuit by ohmmeter and repair or replace defective parts. Replace cur conductors.

EFFECTIVITY: All

Fault	Possible reason	Remedy
Some of dimming controlled circuits is unserviceable.	Cut electric circuit.	Check circuit by ohmmeter and repair or replace defective parts. Replace cut conductors.
	Faulty potentiometer (Fig. 91-4, items C65; C66; C67) or transistor.	Measure the voltage between potentiometer brush and ground while turning the dimming control. The measured voltage should vary from 0 to voltage of board electric network. Replace faulty potentiometer or transistor.
It is impossible to dim the instrument illumination of some controlled circuits.	Cut potentiometer earthing.	Renew potentiometer earthing.
	Faulty potentiometer (Fig. 91-4, items C65; C66; C67) or transistor.	Measure the voltage between potentiometer brush and ground while turning the dimming control. The measured voltage should vary from 0 to voltage of board electric network. Replace faulty potentiometer or transistor.

MAINTENANCE

INSPECTION / CHECK

SERVICEABILITY CHECK OF INTERNAL LIGHTING

1. **Serviceability check of cockpit ceiling lamp**

- a) Turn **MASTER SWITCH** off.
- b) Turn on and off the switch in lamp body.

2. **Serviceability check of placard and instrument illumination**

- a) Turn **MASTER SWITCH** and **BATTERY** switches on.
- b) Turn on and off the **LIGHTING** switch.

3. **Serviceability check of instrument illumination dimming**

- a) Turn **MASTER SWITCH**, **BATTERY** and **LIGHTING** switches
- b) Turn dimming controls one by one from very left to very right position and vice versa. The illumination of pertinent instrument group should change from fully dim to bright and vice versa.

EFFECTIVITY: All

33-10-00

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EXTERNAL LIGHTING

DESCRIPTION AND OPERATION

POSITION (NAVIGATION) LIGHTS

The airplane is equipped with following position lights:

- green (upon the starboard wingtip)
- red (upon port wingtip)
- white (upon elevator).

The position lights are controlled by **POSITION LIGHTS** switch. The wiring diagram of position lights is issued in section 91-30-00.

STROBE LIGHTS (optional)

The strobe lights are installed upon wingtip instead of position lights.

The strobe lights are controlled by **STROBE LIGHTS**. The wiring diagram of strobe lights is issued in section 91-30-00 (airplane from S/N 0046 incl. or in Chapter 95 (SUPPLEMENTS) airplane up to S/N 0045 incl.).

LANDING AND TAXI LIGHTS

The landing and taxi lights are under the cover in port wing leading edge near the outboard fuel tank.

The taxi light is controlled by **TAXI LIGHT** switch and the landing light is controlled by **LANDING LIGHT** switch. The wiring diagram of taxi and landing lights is issued in section 91-30-00.

ANTI-COLLISION BEACON

The anti-collision beacon is inbuild into the upper part of rudder. It is controlled by **BEACON** switch. The wiring diagram of anti-collision beacon is issued in section 91-50-00.

REPAIRS

Fault	Possible reason	Remedy
As soon as the position lights are turned on the POSITION LIGHTS switch turns off.	Short circuit (Fig. 91-4, item C2; C8; C9).	Remove short circuit and repair or replace faulty parts.
	Faulty POSITION LIGHTS switch	Replace switch.
Some of three position lights is not lit.	Cut bulb filament.	Check bulb filament visually or by ohmmeter. Replace faulty bulb.
	Cut electric circuit	Check electric circuit as follows: remove bulb and measure voltage in bulb socket. Replace faulty parts.

WARNING

STROBE LIGHTS ARE FED WITH HIGH TENSION. BEGIN WORKS WITH STROBE LIGHT AT LEAST FIVE (5) MINUTES OR MORE AFTER THE SWITCHING STROBE LIGHTS OFF.

Fault	Possible reason	Remedy
The STROBE LIGHTS switch turns off as soon as the strobe lights are switched on.	Short circuit	Remove short circuit and repair or replace faulty parts.
	Faulty high tension source	Replace the HT source and check strobe light serviceability.
	Faulty STROBE LIGHTS switch	Replace switch.
One of two strobe lights is unserviceable.	Faulty discharge tube	Replace discharge tube and check serviceability of strobe lights.
	Cut electric circuit	Check circuit by ohmmeter and repair or replace defective parts. Replace cut conductors.
The LANDING LIGHT / TAXI LIGHT switch turns off as soon as any of these lights is switched on.	Short circuit (Fig. 91-4, item C3; C4).	Remove short circuit and repair or replace faulty parts.
	Faulty LANDING LIGHT / TAXI LIGHT switch	Replace switch.
Taxi or landing lights are not serviceable.	Cut bulb filament	Check bulb filament visually or by ohmmeter. Replace faulty bulb.
	Cut electric circuit	Check circuit by ohmmeter and repair or replace defective parts. Replace cut conductors.

EFFECTIVITY: All

Fault	Possible reason	Remedy
The BEACON switch turns off as soon as the anti-collision beacon is switched on.	Short circuit (Fig. 91-9. item E3).	Remove short circuit and repair or replace faulty parts.
	Faulty BEACON switch	Replace switch.
The bulb of Whelen WRML anti-collision beacon is not lit but lens system revolves.	Cut bulb filament	Check bulb filament visually or by ohmmeter. Replace faulty bulb.
The bulb of Whelen WRML anti-collision beacon is lit but lens system does not revolve.	Faulty driving motor or stabilized source of motor	Replace anti-collision beacon.
The FS 4400 anti-collision beacon does not flash.	Faulty discharge tube	Replace discharge tube.
	Faulty high tension source	Replace HT source and check serviceability of anti-collision beacon.
	Cut electric cables	Check wires with ohmmeter and replace faulty conductors.

MAINTENANCE

ADJUSTMENT / CHECK

ADJUSTMENT OF TAXI / LANDING LIGHTS

Procedure of landing / taxi light adjustment

CAUTION

LIMIT THE LIGHT SWITCHING ON DUE TO BATTERY CAPACITY TO MINIMUM NECESSARY TIME.

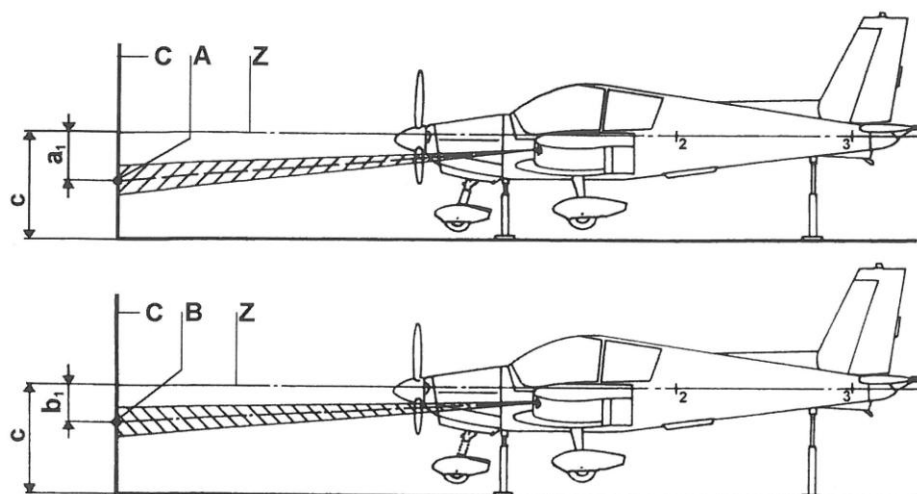
- a) Remove light cover from port wing (Fig. 33-1, item 16):
 - unscrew screws (14) and remove washers (15)
 - shift the taxi/landing light cover (16) forward.
- b) Place the airplane in front of vertical wall (C) provided with check points (A, B) for taxi/landing light adjustment.
- c) Lift the airplane by fuselage jacks (subsection 07-11-00; 07-12-00) and level it to horizontal position. Use longitudinally NiB 2 and 3 on fuselage rear part and laterally NiB 6 of left and right wings (Fig. 08-3).

Recommendation

When using manufacturer supplied jacks (the fwd jack is for light adjustment upon its lower stop) the airplane datum plane (Z) is about 1430 mm (56 in) above the ground.

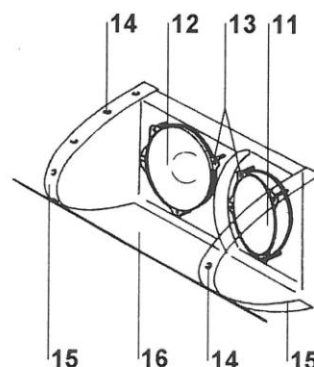
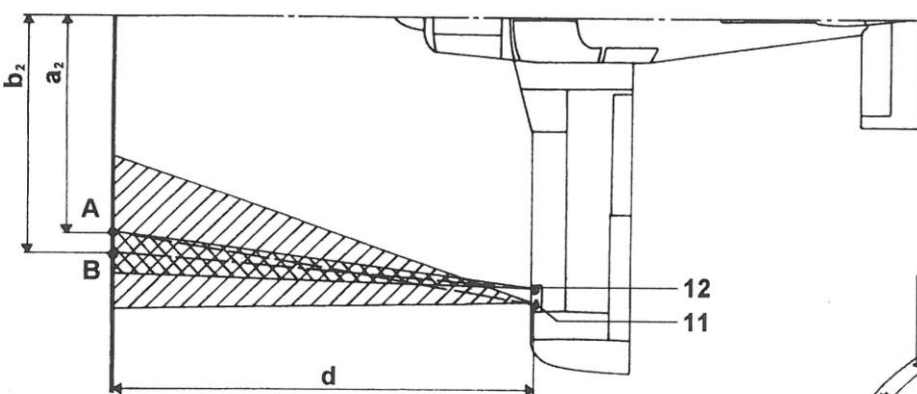
- d) Switch taxi and landing lights one by one (TAXI LIGHT and LANDING LIGHT switches) and check correct setting of light beam axis that should pass through the points A and/or B upon wall C. Adjust the lights (11, 12) if necessary. Each light is provided with three adjusting screws (13) that may be adjusted by screwdriver.
- e) Install light cover (16) upon port wing, fit in the shims (15) and screw screws (14) in.

EFFECTIVITY: All



Dimension		
Mark	mm	in
a ₁	705	27,8
a ₂	3125	123,0
b ₁	620	24,4
b ₂	3475	136,8
c	1430*	56*
d	5000	197,0

* approximately value



----- axis of taxi light
- - - - - axis of landing light

A; B ... check points upon vertical wall C

C ... vertical wall

Z ... datum plane

2; 3 ... NiB

11 ... taxi light

12 ... landing light

13 ... adjusting screw

14 ... screw

15 ... shim

16 ... light cover

Fig. 33-1 Taxi/Landing light adjustment

INSPECTION / CHECK

SERVICEABILITY CHECK OF EXTERNAL LIGHTING

1. Serviceability check of position (strobe) light

- a) Turn **MASTER SWITCH** and **BATTERY** switches on.
- b) Turn (and off) the **POSITION LIGHTS (STROBE LIGHTS)** on).

2. Serviceability check of taxi/landing light

- a) Turn **MASTER SWITCH** and **BATTERY** switches on.
- b) Turn (and off) the **TAXI LIGHT / LANDING LIGHT** on.

3. Serviceability check of anti-collision beacon

- a) Turn **MASTER SWITCH** and **BATTERY** switches on.
- b) Turn (and off) the **BEACON** switch.

EFFECTIVITY: All

EMERGENCY ILLUMINATION

DESCRIPTION AND OPERATION

The auxiliary light is fixed to sliding cockpit canopy. The lamp is turned on and dimmed by the control knob upon the lamp body. The sliding canopy should be before lamp turning on shut and **BEACON** switch turned on. In case of board electric network power failure the lamp is fed from emergency electric source battery (subsection 24-33-00).

The wiring diagram of auxiliary lamp is issued in subsection 91-31-00.

REPAIRS

Fault	Possible reason	Remedy
The auxiliary lamp upon the sliding canopy is unserviceable (the canopy is shut and BEACON switch as well as the switch upon lamp are on.)	Cut bulb filament.	Check bulb filament visually or by ohmmeter and replace faulty bulb.
	Cut C. U. LIGHT 1A fuse (Up to S/N 0045 incl.).	Detect defect and replace faulty fuse
	C. U. LIGHT circuit breaker is OFF (From S/N 0046 incl.).	Detect defect and circuit breaker ON.
	Short circuit (Fig. 91-5, Item C62).	Remove short circuit and repair or replace faulty parts.
	Cut electric circuit.	Check circuit by ohmmeter and replace faulty parts and/or conductors.
	The micro-switch upon the left side of unmovable canopy is improperly fixed (Fig. 91-5, item C64).	Install and properly fix the micro-switch in correct position.
	Faulty micro-switch.	Turn the micro-switch manually on and the measure the voltage upon the contact of sliding canopy. The voltage should be the same as that of board electric network. Replace faulty micro-switch.

EFFECTIVITY: All

MAINTENANCE

INSPECTION / CHECK

SERVICEABILITY CHECK OF AUXILIARY LAMP

- a) Shut sliding canopy.
- b) Turn **MASTER SWITCH** and **BATTERY** switches on.
- c) Turn on (and off) the **BEACON** switch and the switch upon the lamp body.