CHAPTER 17 – LIGHTING

LIST OF ILLUSTRATIONS

1. INTRODUCTION

Aircraft lighting consists of the following systems:

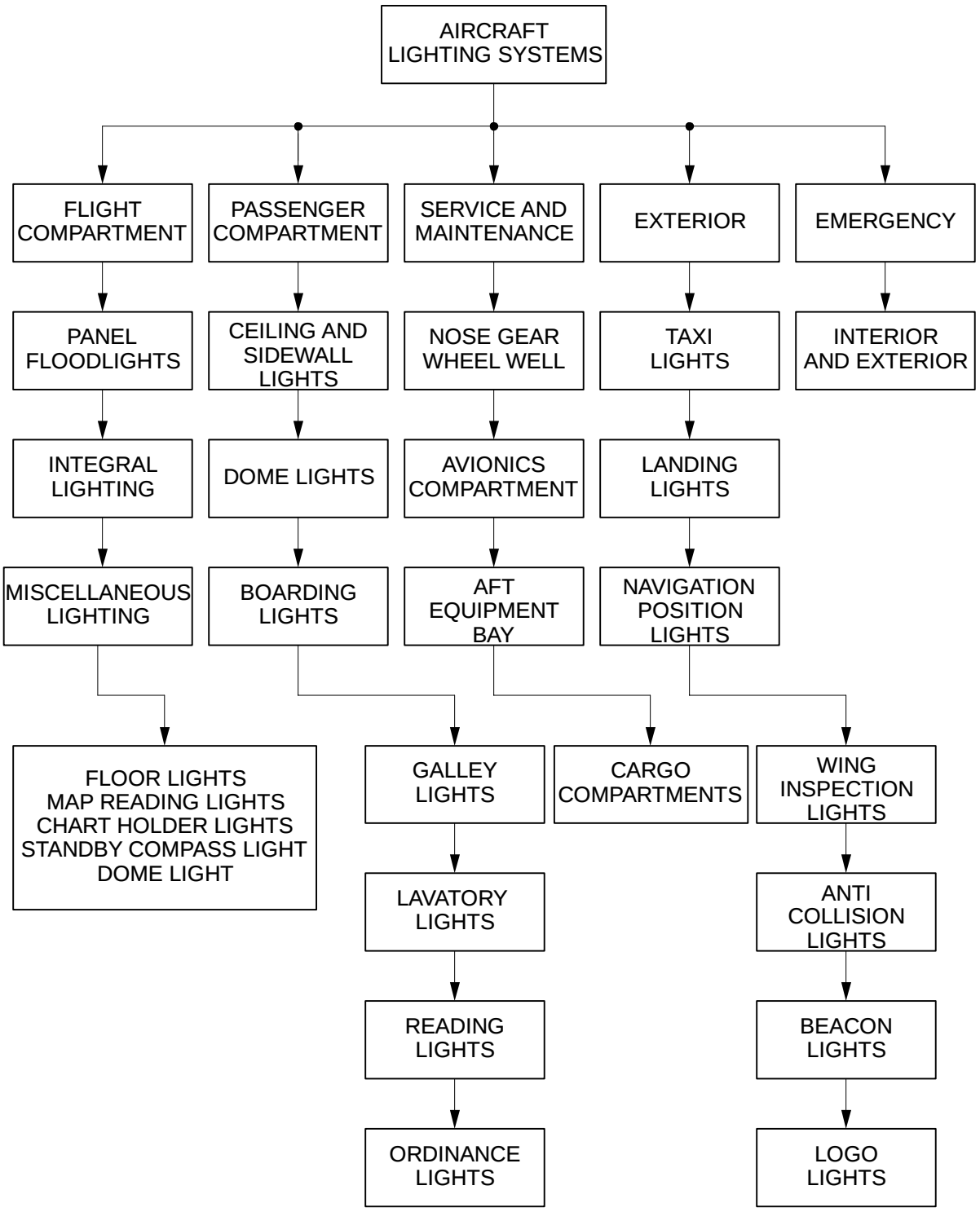
- Flight Compartment Lighting
- Passenger Compartment Lighting
- Service and Maintenance Lighting
- External Lighting
- Emergency Lighting

Lighting control panels for the flight compartment, passenger signs and external lighting are located in the flight compartment overhead panel. Passenger compartment lights are controlled from the forward attendant's panel.

Emergency lighting is controlled from the flight compartment and may also be controlled from the forward attendant's panel. When armed, the emergency lights will come on automatically if essential electrical power is lost.

Service and maintenance lighting is provided for the avionics compartment, baggage compartments, aft equipment compartment and in the landing gear wheelwells. Controls for the lights are located in the area that they illuminate.

Lighting messages are presented on the engine indication and crew alerting system (EICAS) displays.



Lighting Systems – General <1020, 1021>
Figure 17–10–1

1. FLIGHT COMPARTMENT LIGHTING

Flight compartment general area illumination is provided by dome and floor lights. Instrument and control panel lighting is provided by flood lights and integral lighting. Map and reading lights are provided for miscellaneous lighting requirements.

Control panels for the flight compartment lights are located on the overhead panel, at the pilot and copilot side panels and on the center pedestal. Each panel controls the lighting adjacent to the panels location. The controls provide dimming for electronic displays, integral panel lighting and panel flood lighting. Dimming is not provided for floor lighting.

There are three flight compartment dome lights. One light is located in the overhead of the flight compartment entrance and one light is located on each side of the overhead panel. A two position ON/OFF switch on the overhead MISC LTS panel controls the flight compartment entrance light. The pilot's and copilot's dome lights are controlled using the OFF/BRT knob on the respective DM LT panel on each side of the overhead panel.

Floor lighting illuminates the floor area between the rudder pedals and the seat of each pilot. Floor lighting is controlled by a switch on the pilot and copilot side panels.

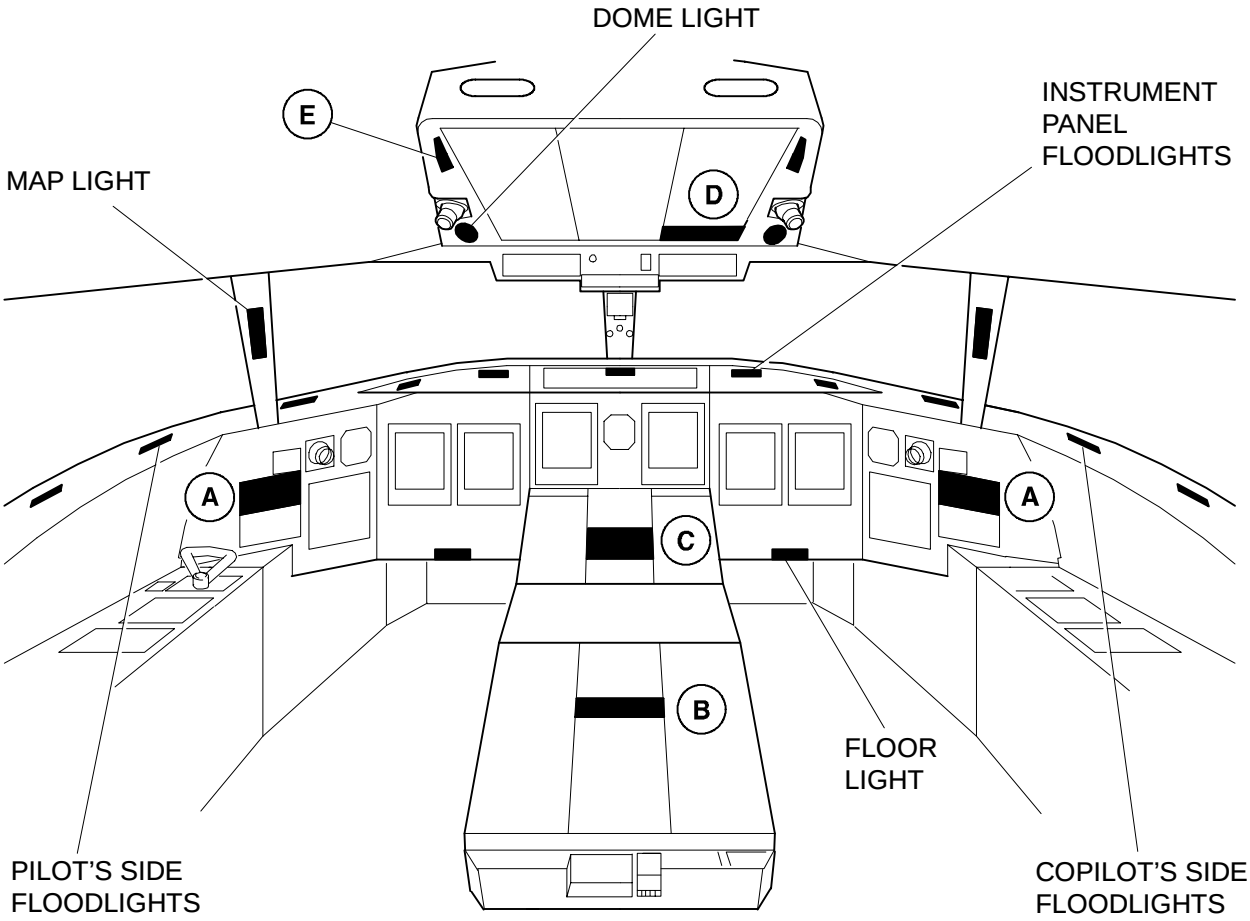
Panel integral lighting with dimming controls supply all the edge lighting for the instrument panels and control panels. The integral lights illuminate the panel names and switch positions to make them more visible for the flight crew.

Cockpit flood lights are operated by dimmers on the pilot and copilot side panels and on the center pedestal lighting panel. The pilots dimmer switch controls the four flood lights on the left side of the flight compartment. The copilots dimmer switch controls the four flood lights on the right side of the flight compartment. The dimmer switch on the center pedestal controls the three flood lights for the instrument panel.

A map light is mounted on each side window post to light the pilot and copilot lap areas. An observers map light, mounted at the cockpit entrance, pivots and swivels for use by any crew member. Light intensity is controlled by a button at the top of the light head and the circular illumination area is controlled by a lever at the bottom of the light head.

When AC power is not available the following will be illuminated by the battery bus:

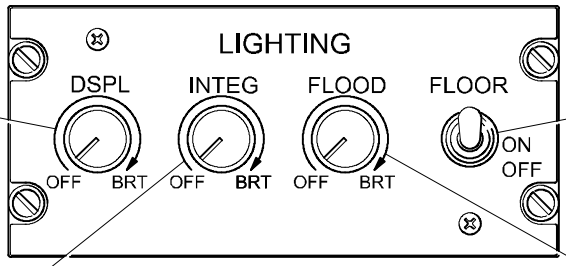
- Fuel control panel
- Fire detection panel
- Engine start and ignition control panel
- Electrical power panel
- APU control panel
- Bleed air control panel
- Standby compass light
- EICAS control panel
- RTU dimming
- Pilot and observer map lights



Flight Compartment Lighting and Lighting Control Panels

Flight Compartment and Lighting Control Panels
Figure 17–20–1

DISPL
Used to control intensity of electronic displays.



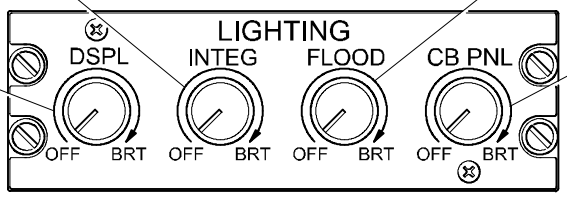
FLOOR
Used to control operation of floor lights.

A Pilot and Copilot Side Panels

INTEG
Used to control intensity of panel integral lighting.

FLOOD
Used to control intensity of panel flood lights.

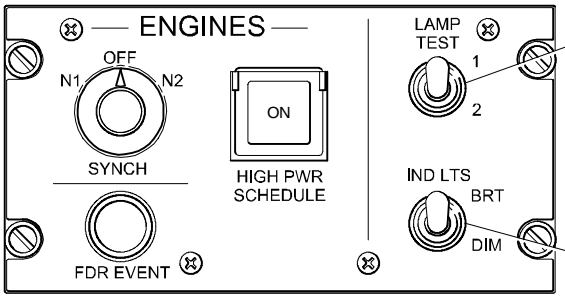
DISPL
Used to control intensity of electronic displays.



CB PNL
Used to control intensity of circuit breaker panel integral lighting.

B Center Pedestal

LAMP TEST
Used to test flight compartment indicator lamps in overhead and center pedestal panels.
- 1 – Tests all lamps on lamp driver unit channel 1.
- 2 – Tests all lamps on lamp driver unit channel 2.



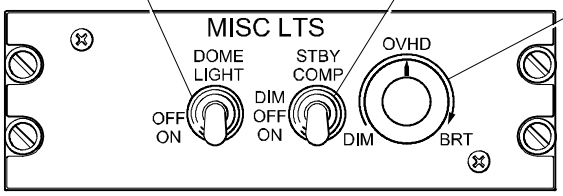
IND LTS
Used to set indicator lamp intensity.
- DIM – Selects intermediate brightness level for indicator lights (night operation).
- BRT – Selects maximum brightness level for indicator lights (day operation).

C Center Pedestal

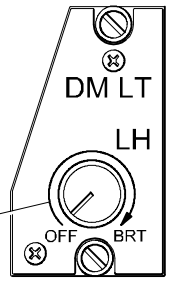
DOME LIGHTS
Used to control the Pilot's, Copilot's and flight compartment entrance dome lights.

STBY COMP
Used to control operation of standby compass lighting.

OVHD
Used to control intensity of overhead panel integral lighting.



DM LT
Used to control intensity of dome light.



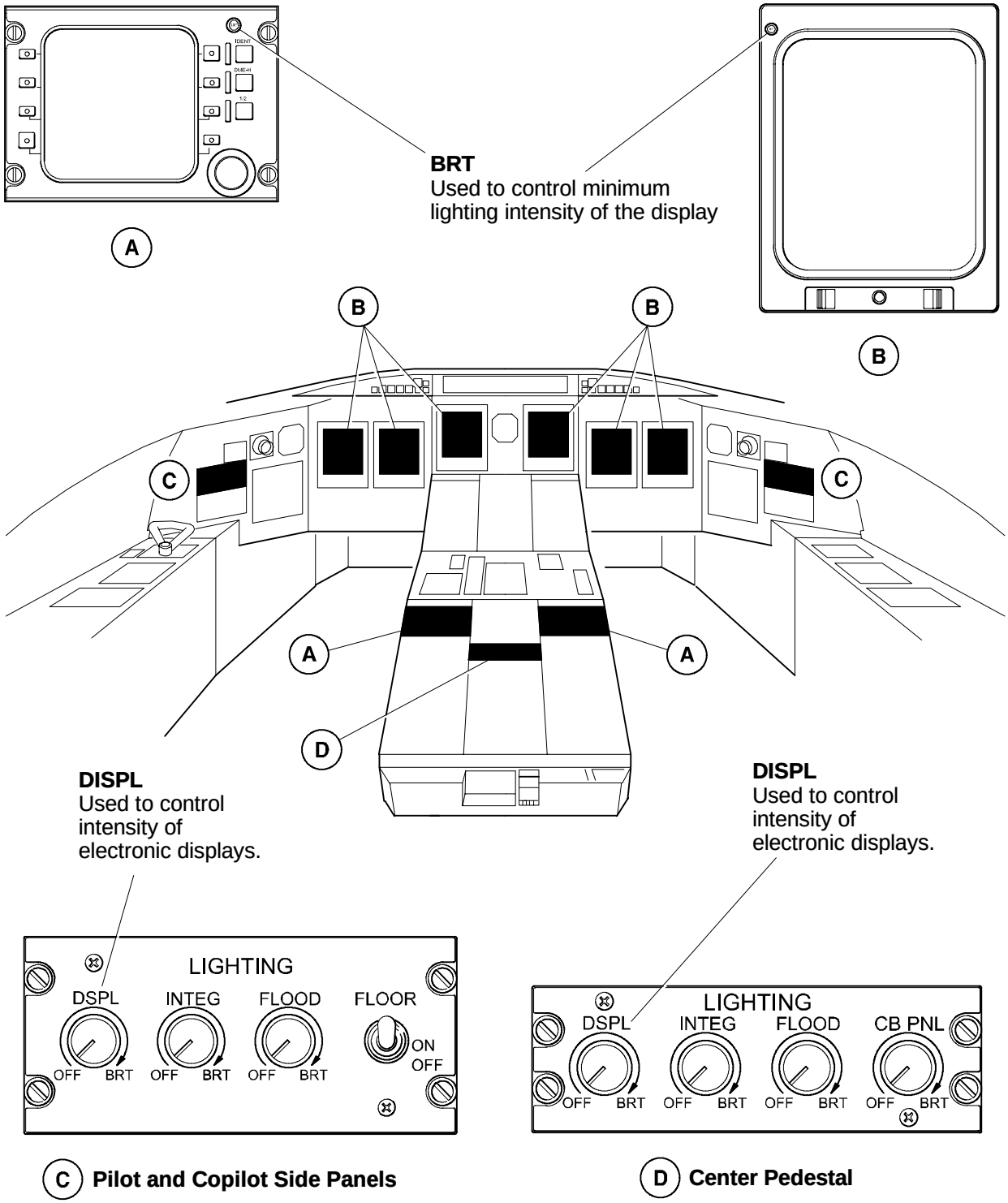
D Overhead Panel

E Overhead Panel

Flight Compartment Lighting Controls
Figure 17–20–2

2. CRT LIGHTING ADJUSTMENT

Two separate control switches are used to adjust display lighting intensity. In the upper left corner of the display unit, a BRT adjustment knob is used to set the minimum lighting intensity for the associated screen. After adjusting the BRT knob to a minimum level, the pilot can select the desirable level of lighting for the EFIS and EICAS displays by using the DSPL knob located on the associated lighting panel.



CRT Lighting Intensity Adjustment
Figure 17–20–3

A. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Flight Compartment Lighting	Dome Lights	CKPT DOME LIGHTS	MAIN BATTERY DIRECT BUS	6	B5	
		CKPT DOME LIGHT	DC BUS 1	1	E4	
	Floor Lights	LIGHTS CKPT FLOOR			G7	
	Flood Lights	INST FLOOD LTS	DC ESSENTIAL	2	U2	
	Instrument Lights	INTEG LTS CB PNLS	AC ESSENTIAL	1	V4	
		INTEG LTS PLT PNLS			V5	
		INTEG LTS CTR PNLS			V6	
		INTEG LTS O/H PNLS			V7	
		INTEG LTS C/PLT PNLS	AC BUS 2	2	B14	
		LIGHTS O/H PNL	BATTERY BUS	1	P5	
		LIGHTS EICAS/RTU DIMMING			P6	
	Map Lights	LIGHTS PLT MAP			P2	
		LIGHTS C/PLT OBS MAP			P3	
		LIGHTS C/PLT MAP	DC BUS 2	2	G7	
	Chart Holder Lights	LIGHTS CHART HOLDER			G6	

1. PASSENGER COMPARTMENT LIGHTING

Passenger compartment lighting is supplied by ceiling and sidewall fluorescent lights. Some of the ceiling lights are powered by the AC essential bus and remain available in the event that the AC service bus becomes lost. Entrance lighting consists of six fluorescent lights in the entrance ceiling panels and three lights in the stairs of the passenger door. Ceiling, sidewall and entrance lighting is controlled from the forward flight attendant's panel.

Two reading lights are installed in each passenger service unit (PSU). They supply personal lighting for passenger use and can be controlled independently. The passenger reading lights can be tested and reset using switches on the forward flight attendants panel. Each flight attendant station is equipped with a reading light controlled by a switch on the attendant's panel.

Lighted NO SMOKING and FASTEN SEAT BELTS ordinance signs are installed in each PSU, in the lavatories, and in the main entrance. The lavatories also have return to seat symbols. Control of the ordinance signs is provided on the PASS SIGNS overhead panel in the flight compartment.

The lavatory is illuminated by three fluorescent lights (two in the vanity and one above the counter). The lights come on dim when aircraft power is applied. With the lavatory door locked, the vanity light assembly will come on bright.

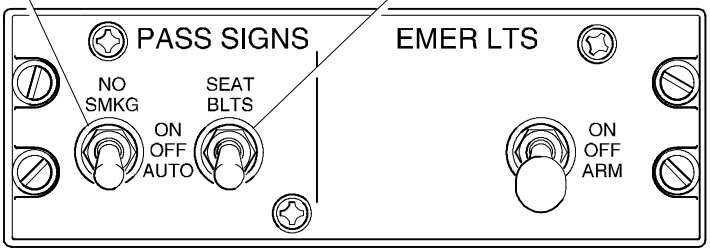
Galley lighting is provided by six fluorescent lights in the galley ceiling panel. Two switches on the galley control panel control the galley lights. Lights in the wardrobe and stowage compartments are controlled by micro-switches in the doors, so that the lights come on when the door is opened.

NO SMKG Switch

- AUTO - The corresponding signs located throughout the cabin come on when the landing gear is extended or cabin altitude is greater than 10,000 feet.
- OFF - Turns off all NO SMOKING signs.
- ON - Turns on all NO SMOKING signs.

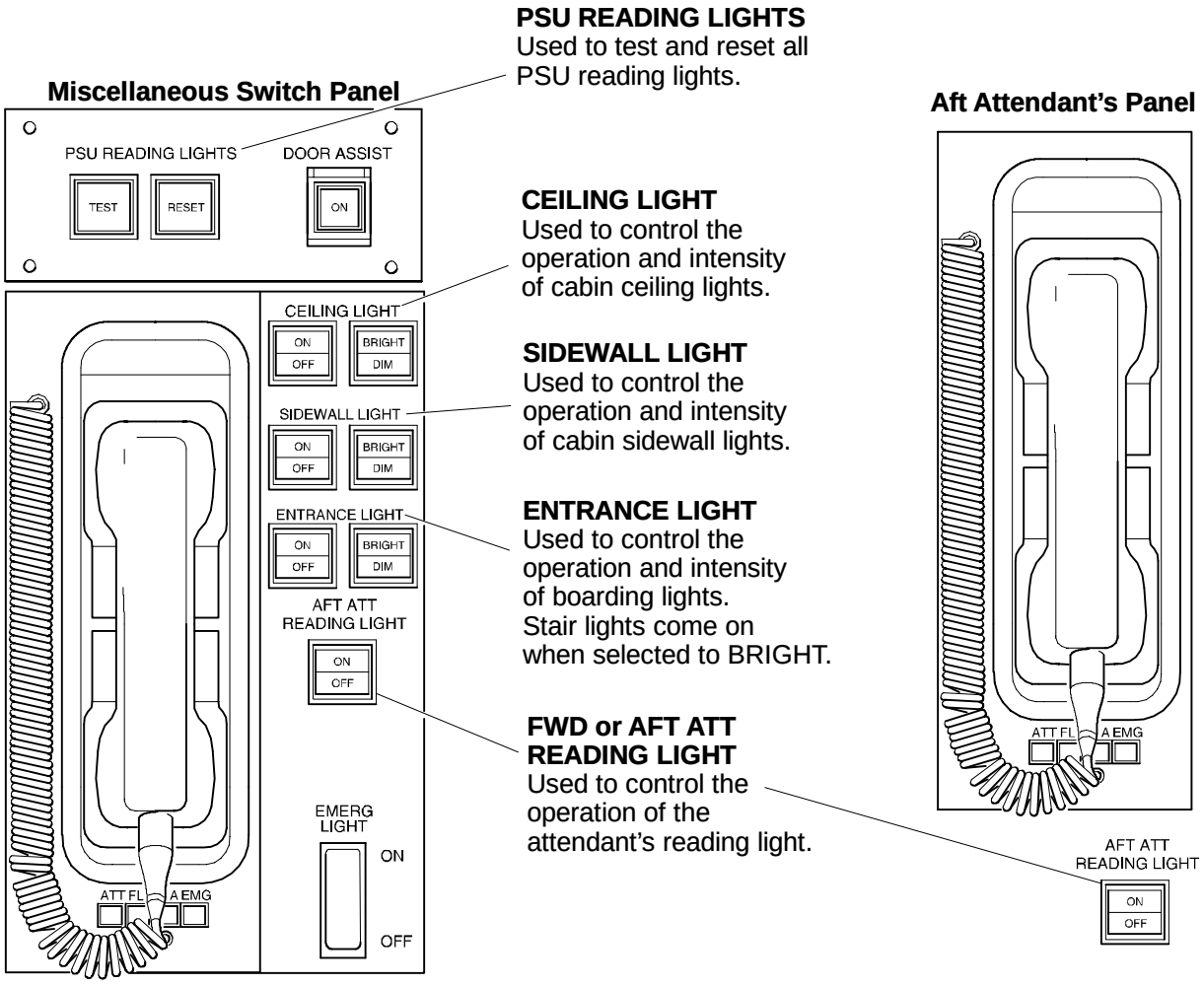
SEAT BLTS Switch

- AUTO - The corresponding signs throughout the cabin come on when cabin altitude is greater than 10, 000 feet, when the landing gear is extended or when flaps are greater than 0 degrees.
- OFF - Turns off the SEAT BELT signs and RETURN TO SEAT sign in the lavatory.
- ON - Turns on the SEAT BELT signs and RETURN TO SEAT sign in the lavatory.



Passenger Signs and Emergency Lights Panel
Overhead Panel

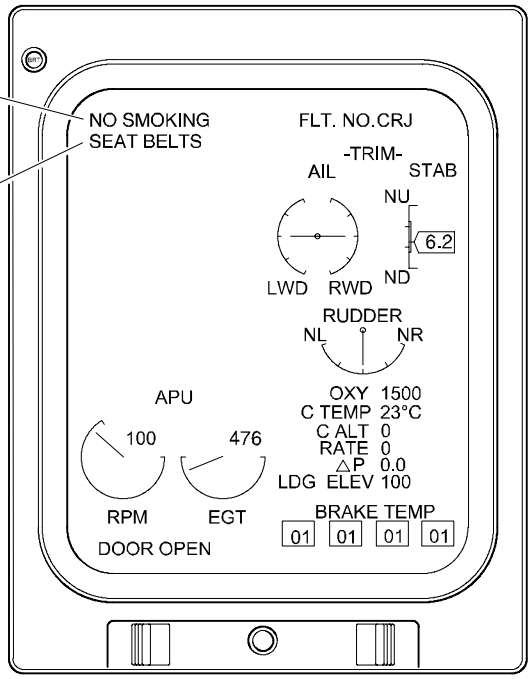
Passenger Signs and Emergency Lights Panel
Figure 17–30–1



Flight Attendant's Panels
Figure 17–30–2

NO SMOKING status (white)
Indicates that the no smoking signs have been selected on, automatically or manually.

SEAT BELTS status (white)
Indicates that the seat belts signs have been selected on, automatically or manually.



Status Page

No Smoking and Seat Belts EICAS Messages
Figure 17–30–3

A. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Passenger Compartment Lighting	Cabin Lighting	CABIN LIGHTING CEILING	AC ESSENTIAL	1	T10	
		CABIN LIGHTING CEILING	AC SERVICE	2	D14	
		CABIN LIGHTING SIDEWALL			E14	
		LIGHTS CAB UTIL	BATTERY BUS	1	P4	
	Passenger Signs	PASS SIGNS			M10	
	Passenger Reading Lights	R CABIN READING LIGHTS FWD	DC UTILITY	2	L3	
		R CABIN READING LIGHTS AFT			L4	
		L CABIN READING LIGHTS FWD	DC BUS 1	1	E2	
		L CABIN READING LIGHTS AFT			E3	
	Boarding Lights	LIGHTS BOARD	DC SERVICE	2	M3	
	Lavatory Lights	LIGHTS TOILET			M5	
	Galley Lights	LIGHTS GALLEY AREA			M6	

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1. SERVICE AND MAINTENANCE LIGHTING

Service lighting is provided for the cargo compartments and external loading area. Maintenance lighting is provided for the landing gear bays, APU compartment, aft equipment compartment and the underfloor avionics compartment. <2046>

A. Service Lighting

Two lights illuminate the forward cargo compartment. The forward cargo compartment lights are controlled by a switch located at the inside forward edge of the forward cargo door opening. Activation requires a weight-on-wheels signal to ensuring that the lights are off when the aircraft is in flight.

Two lights illuminate the aft cargo compartment. The aft cargo compartment lights are controlled by a switch located at the inside forward edge of the cargo door. Activation requires a weight-on-wheels signal to ensuring that the lights are off when the aircraft is in flight.

External loading area lighting consists of a forward cargo compartment loading area light and an aft cargo compartment loadng area light. The lights are designed to illuminate the cargo compartment loading areas. <2046>

The forward cargo compartment loading area light and switch is installed within the forward cargo compartment. The light illuminates the loading area and the ground immediately below the loading area, when the forward cargo door is open. <2046>

The aft cargo compartment loading area light is installed under the left engine pylon and angled to illuminate the loading area and the ground immediately below the aft cargo door. The light switch is located inside the aft cargo compartment. <2046>

B. Maintenance Lighting

Six flood lights are installed down the length of the underfloor avionics compartment. The lights are controlled by a switch located in the compartment.

Two lights and a control switch are installed in the aft equipment compartment.

Two lights and a control switch are installed on the APU rear bulkhead to illuminate the APU compartment area.

Two high intensity halogen lights are installed in each main landing gear bay. Each light has a control switch located next to it. A single high intensity halogen light and switch is installed in the nose landing gear bay.

NOTE

At this time, the main landing gear maintenance lights have been disabled through SB670-31-003.

C. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Service and Maintenance	Maintenance	LIGHTS MAINT	DC BUS 1	1	G10	
	Service	LIGHTS FWD SERV	DC SERVICE	2	M1	
		LIGHTS AFT SERV			M2	
		SERV AREA			M7	

1. EXTERNAL LIGHTING

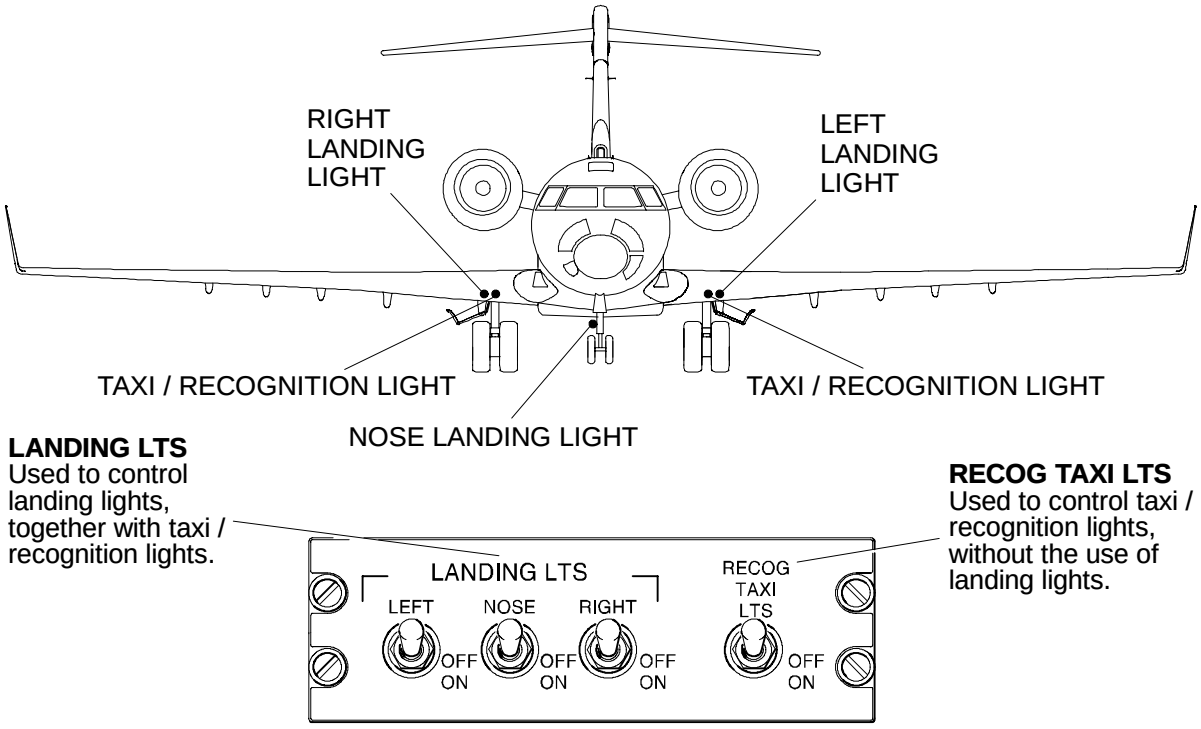
External lighting consists of landing, taxi, navigation, beacon, anti-collision strobe, logo and wing inspection lights. Control of the landing and taxi lights is provided by switches on the LANDING LTS panel located on the overhead panel. All other external lighting is controlled by switches on the EXTERNAL LTS panel, also located on the overhead panel. <1020,1021>

A. Landing and Taxi Lighting

One landing light is installed in the leading edge of each wing and one is installed on the nose landing gear. The taxi lights are installed inboard of the wing landing lights, in the same wing compartments. The taxi lights also serve as recognition lights.

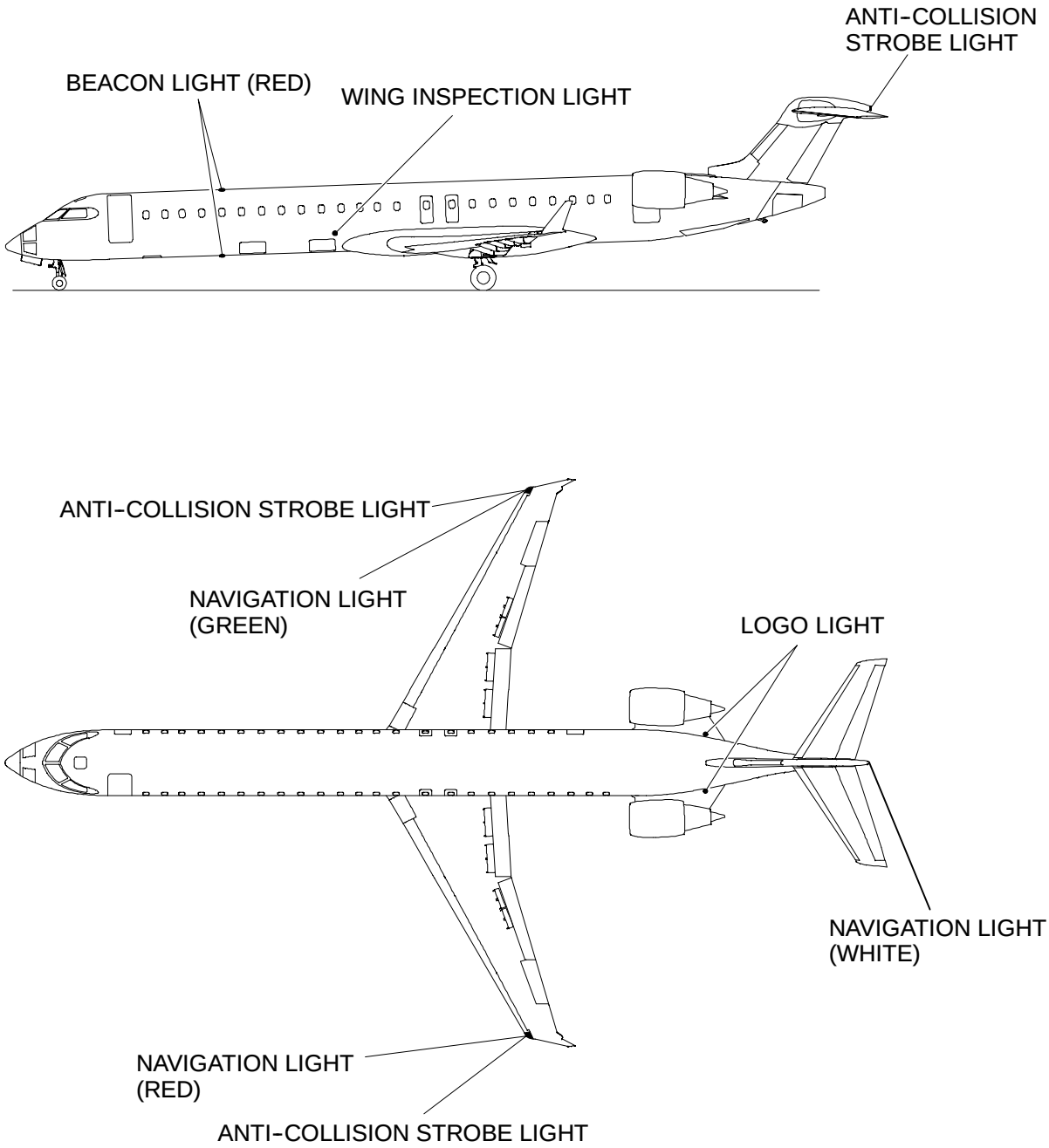
The nose gear landing light is installed on a bracket on the nose gear and is designed to illuminate the ground during landing and take-off. Activation requires a gear downlock signal to prevent the light from being on when the landing gear is retracted.

The wing landing lights and taxi lights are high intensity discharge lamps. The landing lights are controlled by the LEFT, RIGHT and NOSE landing light switches on the LANDING LTS panel. The taxi lights are controlled, separately from the landing lights, by the RECOG/TAXI LTS switch on the same panel.



Landing Lights Panel
Overhead Panel

Landing and Taxi Lights
Figure 17–50–1



External Lighting <1020, 1021>
Figure 17–50–2

B. Navigation Lighting

A dual navigation light system is installed in the aircraft for additional dispatch reliability. The navigation lights consists of two red lights in the left wing tip, two green lights in the right wing tip and two white lights on the aft end of the vertical stabilizer. The lights provide visual tracking and orientation of the aircraft in relation to an observer. The navigation lights are controlled by a NAV switch on the EXTERNAL LTS panel.

C. Beacon Lights

Two red beacon lights are installed on the aircraft to permit the aircraft to be seen from a distance. One light is installed on the top of the fuselage and one light is installed on the bottom of the fuselage. The lights are controlled by a BEACON switch on the EXTERNAL LTS panel. The lights are also used during ground operations to provide indication that the aircraft is powered and may have engines running. <1021>

D. Anti-Collision Strobe Lights

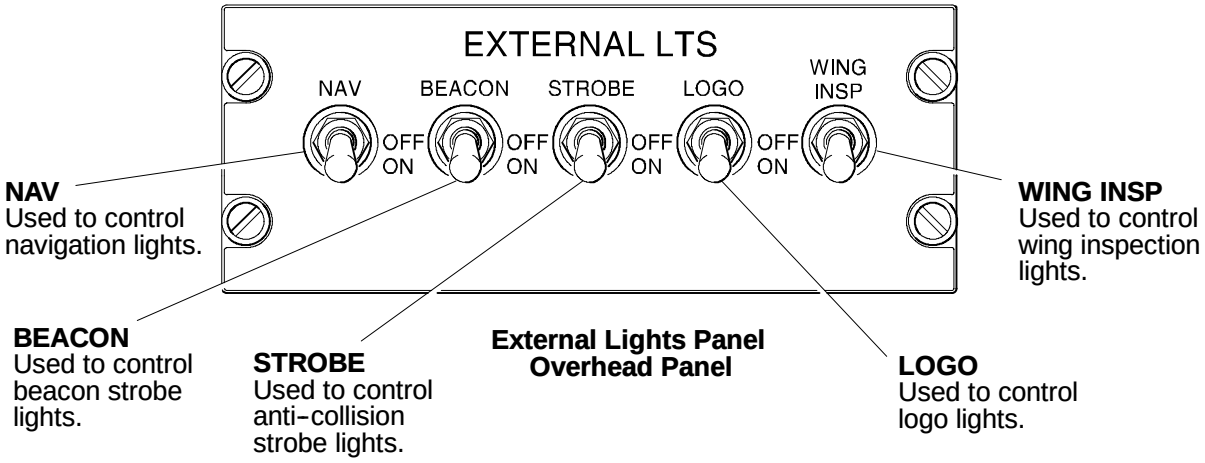
There are three white anti-collision strobe lights on the aircraft. One light is installed in each wing tip and one is installed on the aft end of the vertical stabilizer next to the tail navigation lights. They are synchronous lights that flash continuously. The light are controlled by a STROBE switch on the EXTERNAL LTS panel.

E. Logo Lighting

A white logo light is installed on the upper surface of each engine pylon to illuminate the airline logo on each side of the vertical stabilizer. The lights are controlled by a LOGO switch on the EXTERNAL LTS panel <1020>

F. Wing Inspection Lighting

A white wing inspection light is installed on each side of the fuselage just forward of the wing. The lights are controlled by a WING INSP switch on the EXTERNAL LTS panel and allow the pilots to monitor the wing leading edges for ice accumulation.



External Lights Panel <1020, 1021>
Figure 17–50–3

G. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
External Lighting	Landing Lights	LIGHTS LDG WINGS	BATTERY BUS	1	P1	
		LIGHTS LDG NOSE	DC BUS 1		G6	
	Taxi Lights	TAXI LTS			F5	
	Wing Inspection Lights	LIGHTS WING INSP			G9	
	Anti-Collision Strobe Lights	LIGHTS REAR A/COLL			G8	
		LIGHTS WING A/COLL	DC BUS 2	2	G8	
	Navigation Lights	LIGHTS NAV	DC SERVICE		M4	
	Beacon Lights	BEACON LIGHTS			M8	<1021>
	Logo Lights	LOGO LIGHTS	AC SERVICE		D11	<1020>

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1. EMERGENCY LIGHTING

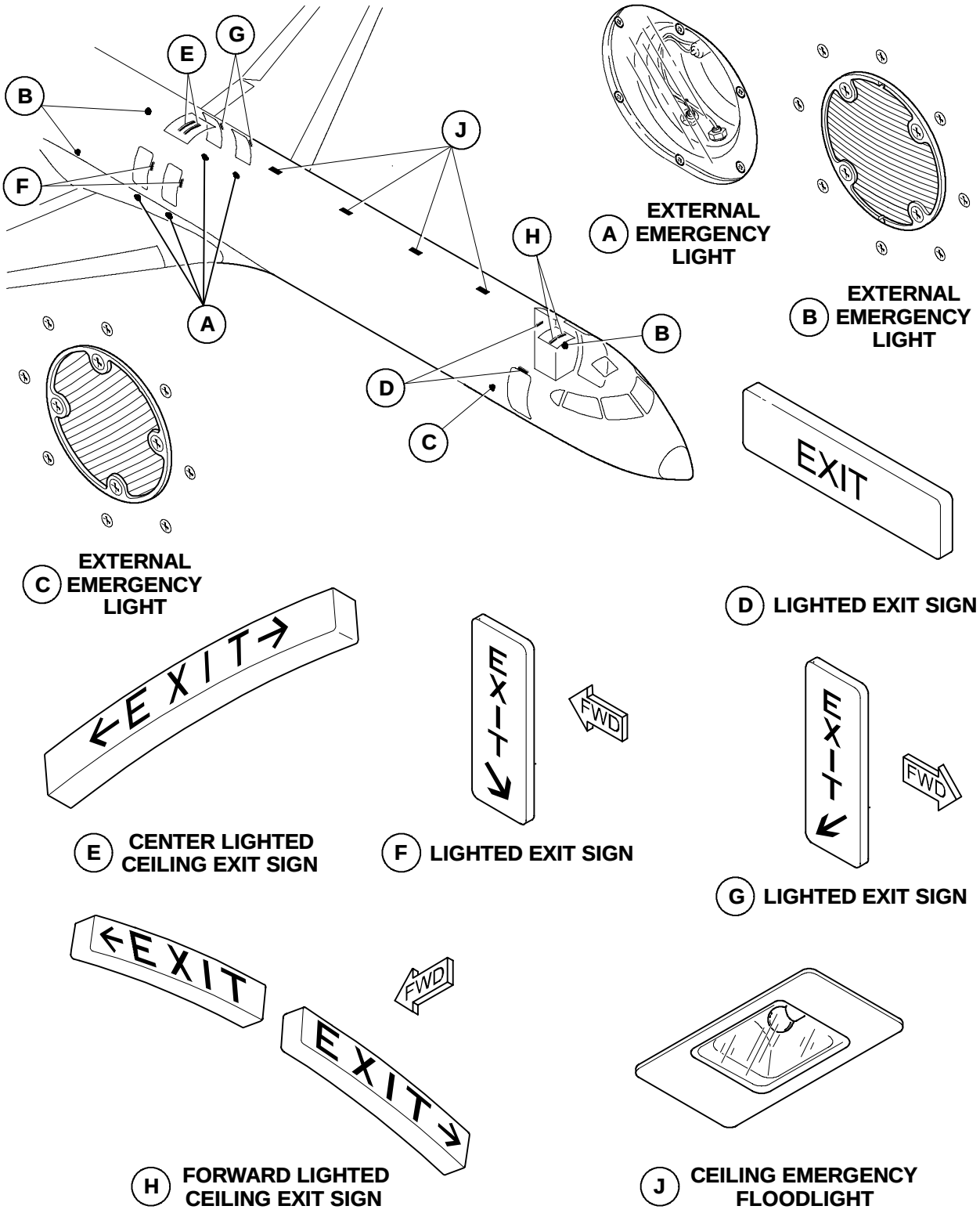
Emergency lighting is provided in the event of an emergency evacuation of the passengers and crew from the aircraft.

External emergency lights provide illumination of the overwing evacuation exit paths and exterior areas around the forward passenger door and service door. <2224>

Internal emergency lighting provides emergency lighting to the passenger cabin, emergency exits and interior exit paths. The internal emergency lights include lighted exit signs near all six emergency exits at floor level, at eye level and on the ceiling. There are ceiling flood lights installed along the length of the passenger compartment and floor-level flood lights at the passenger door and service door. Photoluminescent strips are installed along the floor on both sides of the aisle to provide illuminated escape path routing to each emergency exit. The Photoluminescent strips are sufficiently charged after 15 minutes of exposure to interior cabin lighting. <2224>

Electrical power for all emergency lighting is supplied by five self-contained battery packs. The battery packs contain 6-Volt nickel-cadmium batteries that are supplied with a trickle charge from the DC essential bus. The battery packs are designed to illuminate all emergency light systems for approximate 10 minutes.

Emergency lighting is controlled by a cockpit switch on the EMERG LTS panel located on the overhead panel or by a guarded EMERG LIGHTS switch on the forward attendant's panel. The emergency lights can be manually turned on using either switch. With the cockpit switch in the ARM position, the emergency lights will come on automatically if AC or DC essential power is lost.



A EXTERNAL EMERGENCY LIGHT

B EXTERNAL EMERGENCY LIGHT

C EXTERNAL EMERGENCY LIGHT

D LIGHTED EXIT SIGN

E CENTER LIGHTED CEILING EXIT SIGN

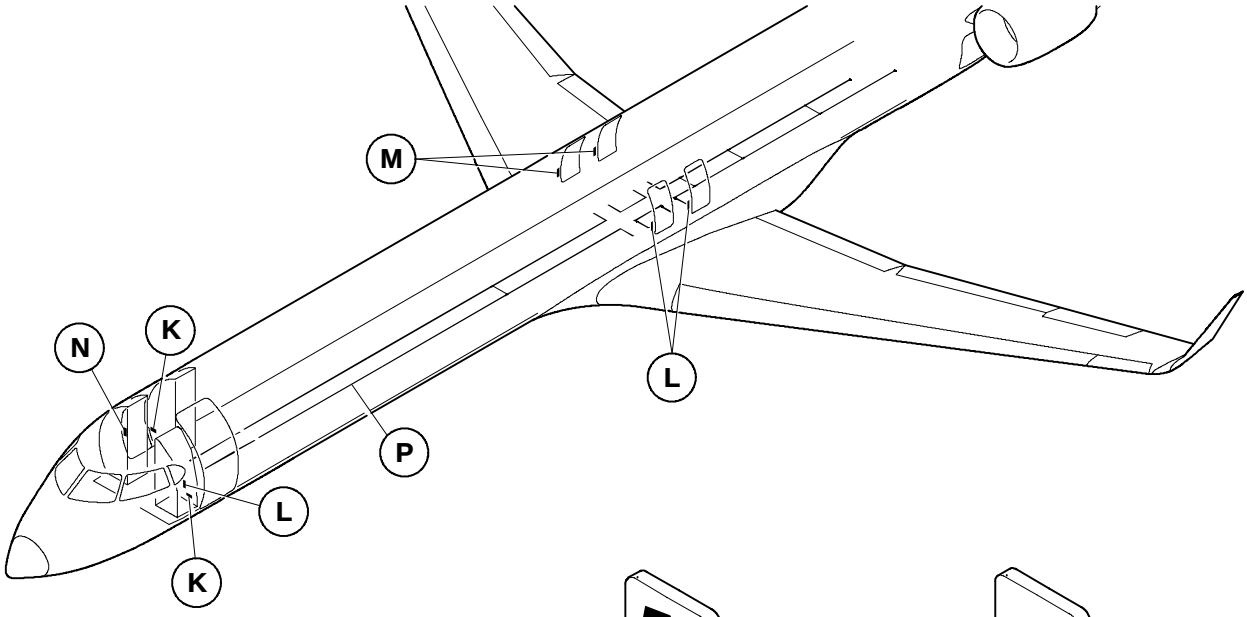
F LIGHTED EXIT SIGN

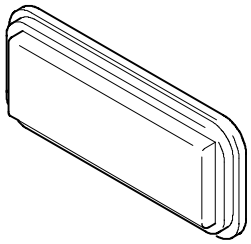
G LIGHTED EXIT SIGN

H FORWARD LIGHTED CEILING EXIT SIGN

J CEILING EMERGENCY FLOODLIGHT

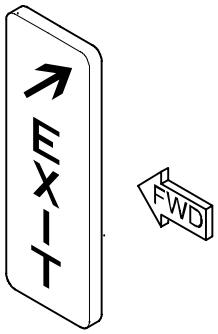
External and Internal Emergency Exit Lights
Figure 17–60–1 (Sheet 1)



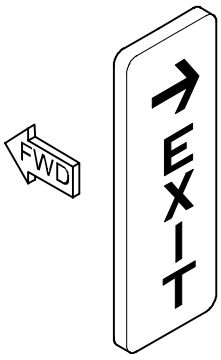


K FLOOR-LEVEL EMERGENCY FLOODLIGHT

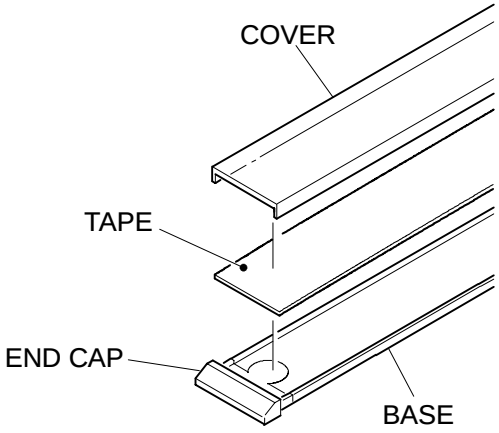
L LIGHT FLOOR-LEVEL EXIT SIGN



M LIGHTED EXIT SIGN

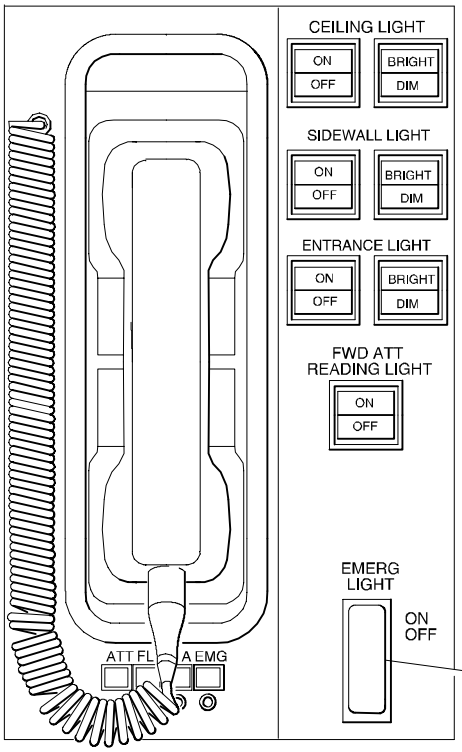


N LIGHT FLOOR-LEVEL EXIT SIGN



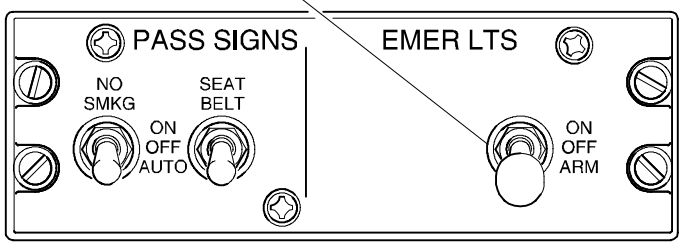
P FLOOR-PATH PHOTOLUMINESCENT TAPE

External and Emergency Exit Lights
Figure 17-60-1 (Sheet 2)



Forward Attendant's Panel

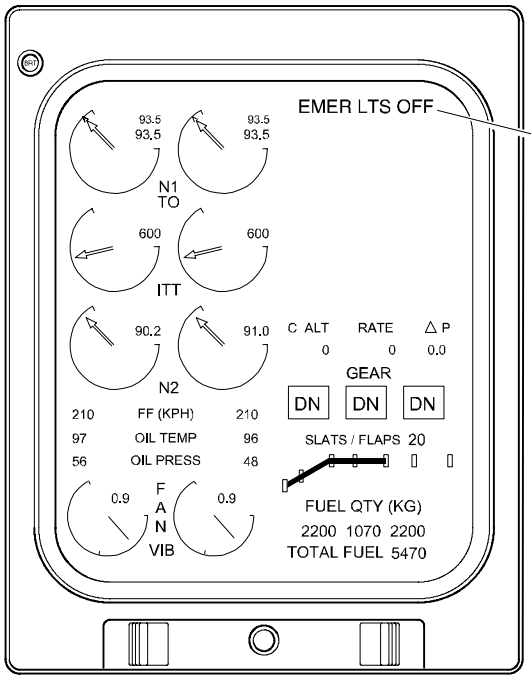
EMER LTS
Used to control operation of emergency lighting system.
- ON - Turns on all emergency lights.
- OFF - Prevents actuation of emergency lights system.
- ARM - Emergency lights come on automatically if AC or DC essential power is lost.



Passenger Signs and Emergency Lights Panels
Overhead Panel

EMERG LIGHT (Guarded)
Used to manually control emergency lighting system.

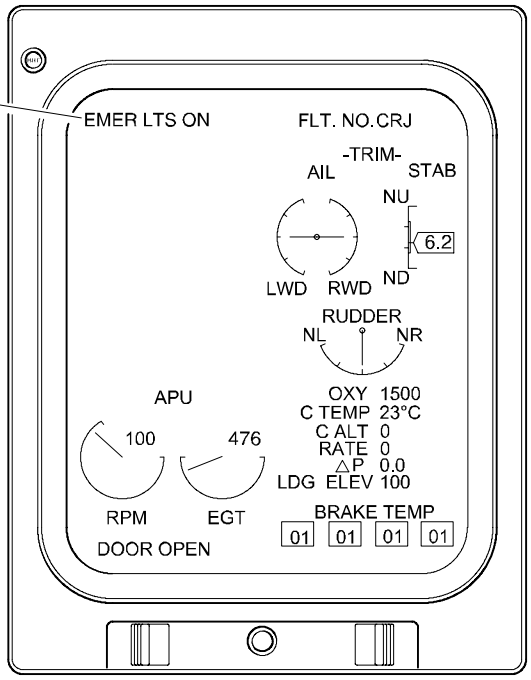
Emergency Lighting Controls
Figure 17–60–2



Primary Panel

Emer LTS OFF (amber)
Indicates that the emergency lighting system has been selected off.
- Battery pack voltage is < 4.5 volts,
- Lights are off.

EMER LTS ON status (white)
Indicates that emergency lighting system is operational and battery pack voltage is > 4.5 volts.



Status Page

Emergency Lights EICAS Indications <1001>
Figure 17-60-3

A. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Emergency Lighting	Emergency Lights	EMER LTS	DC ESSENTIAL	2	U3	