

SECTION 2-06

LIGHTING

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**AIRPLANE
OPERATIONS
MANUAL**



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JANUARY 21,2002

ACM-145/1114

GENERAL

This airplane is equipped with a lighting system in order to illuminate all essential parts located inside and outside of the fuselage and to assure a proper and safe operation of the airplane.

The cockpit is illuminated by dome, chart, fluorescent/flood and reading lights. External lighting consists of navigation, anticollision (strobe and red beacon), landing, taxi, inspection and logotype lights.

The system also provides lighting for baggage and service compartments.

COCKPIT LIGHTING

The lighting system inside the cockpit is composed of five different types of lights, which are as follows:

- Dome lights.
- Reading lights.
- Chart lights.
- Fluorescent flood/storm light.
- Instruments and panels lights.

DOMES LIGHTS

Cockpit illumination is provided by two dome lights of fixed intensity, commanded by a switch on the overhead panel. One light is located above the pilot's seat and the other is located above the copilot's seat.

READING LIGHTS

In order to provide adequate light distribution for the reading of maps, check lists and manuals there are three reading lights inside the cockpit, one for the pilot, a second for the copilot and a third for the observer.

By rotating the inner bezel of each of these three light installations, lighting intensity can be adjusted from off to full bright according to crew preference. The aperture or size of the light pattern is independently adjustable from a small to a large square pattern by rotating the outer bezel.

CHART LIGHTS

Chart lights are provided to illuminate the chart holders located at the pilot's and copilot's control wheel.

The chart light is turned on when the chart holder assembly is lifted. Light intensity is controlled by potentiometer knobs located on each side of the glareshield panel and may be selected from dim to full bright.

**FLUORESCENT FLOOD/STORM LIGHT (OPTIONAL)**

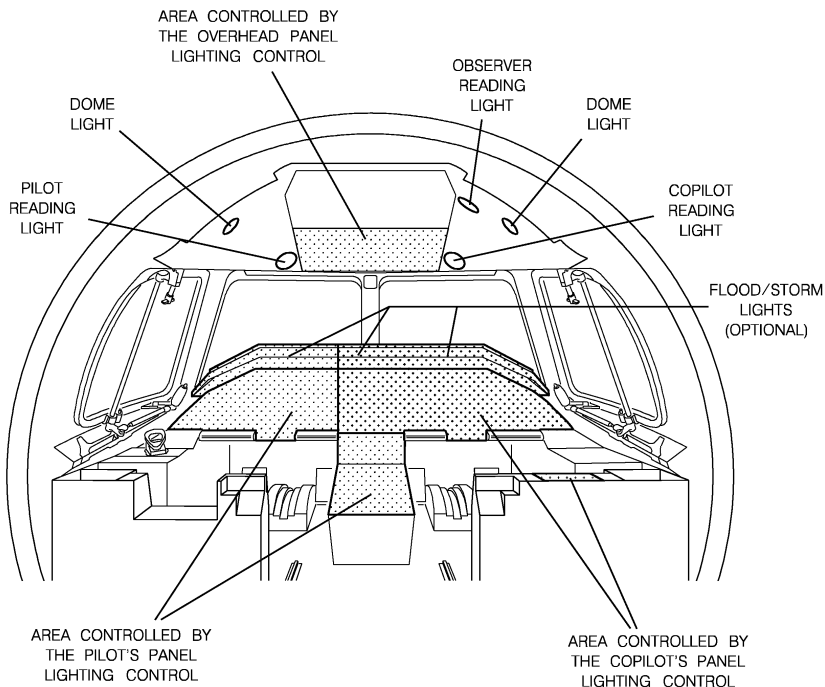
Three flood/storm lights provide a proper lighting level in the cockpit and assures instrument readability when the ambient lighting is too intense with lightning flashes.

The lights are located under the glareshield panel, two for the pilot's and central side and the other for the copilot's side. Light intensity is controlled by potentiometer knobs located on each side of the glareshield panel and may be selected from off to full bright.

INSTRUMENTS AND PANELS LIGHTS

The instrument and control panel lights system provides lighting for instruments, control panels, and pushbuttons. Light intensity is controlled by potentiometer knobs located on each side of the glareshield panel and on the overhead panel.

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COCKPIT LIGHTING

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CONTROLS AND INDICATORS

GLARESHIELD PANEL

1 - FLOODLIGHT CONTROL KNOBS

- Turn on/off and regulate the brightness of flood lighting.
- Pilot's knob controls pilot's panel, center panel and control pedestal.
- Copilot's Knob controls copilot's panel.

2 - CHART HOLDER LIGHTING CONTROL KNOBS

- Regulate the brightness of associated chart holder lighting.

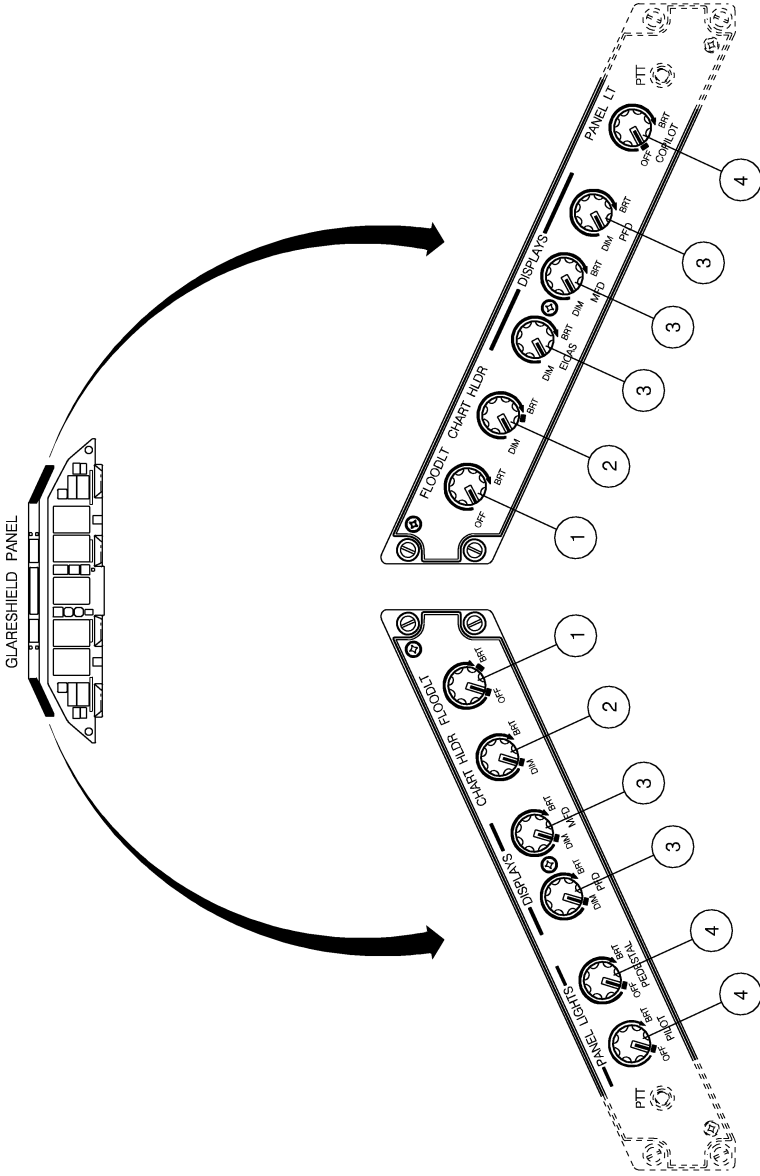
NOTE: Chart light is turned on when the chart holder assembly is lifted.

3 - DISPLAYS LIGHTING CONTROL KNOBS

- Regulate the brightness of Electronic Display.
- Pilot's knobs control pilot's PFD and MFD.
- Copilot's knobs control EICAS and copilot's PFD and MFD.

4 - PANEL LIGHTING CONTROL KNOBS

- Turn on/off and regulate the brightness of panels lighting.
- Pilot's knobs control pilot's panel, center panel and control pedestal.
- Copilot's knob controls copilot's panel and observer panel.



OVERHEAD PANEL**1 - PUSHBUTTON LIGHTS TEST SWITCH (if installed)**

- When actuated to the TEST position (momentary position) allows checking of the striped bars and caption indications.
- The striped bars and caption indications in all pushbuttons located on the main panel, overhead panel, control pedestal and right lateral console will illuminate, allowing verification of lamp integrity.
- The fire handles, APU fire extinguish button, BAGG EXTG button, electromechanical GUST LOCK indication lights, GPU AVAIL annunciator, digital pressurization control button and ATDT CALL button will not illuminate and will not be tested.

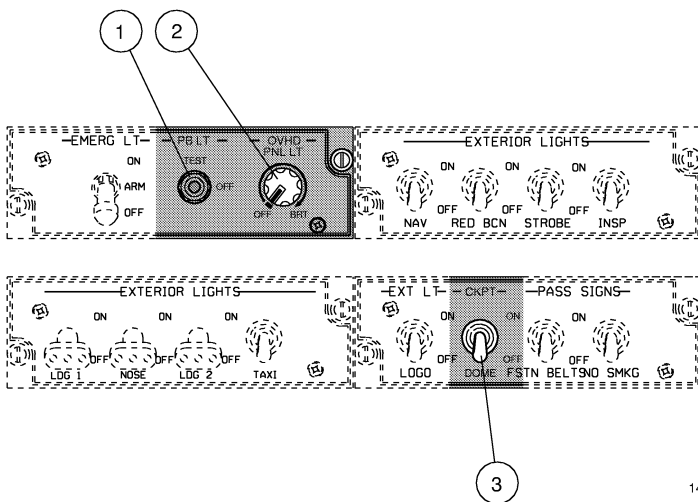
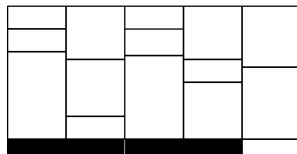
2- OVERHEAD PANEL LIGHTING CONTROL KNOB

- Turns on/off and regulates the brightness of the overhead panel lighting.

3 - COCKPIT DOME LIGHTS SWITCH

- Turns on/off the two cockpit dome lights.

OVERHEAD PANEL



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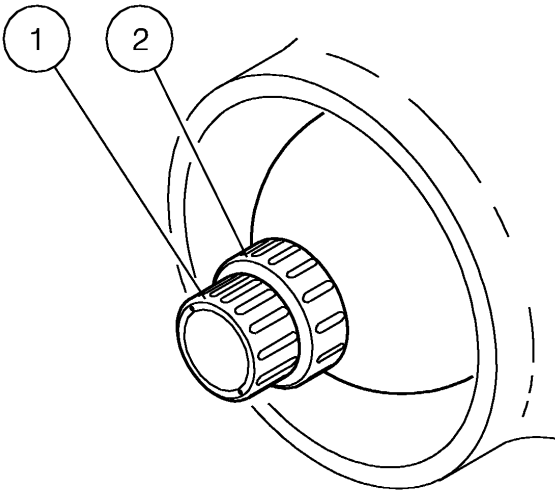
OVERHEAD PANEL

FLIGHT CREW READING LIGHTS**1 - INNER RING**

- Provides turn on/off and dimming control.

2 - OUTER RING

- Provides reading area adjustment, allowing light beam orientation up to 35 degrees from the vertical axis in any direction.



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FLIGHT CREW READING LIGHTS

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PASSENGER CABIN LIGHTING

Passenger cabin lighting includes general illumination, reading lights, lavatory, galley lights and cabin signs.

GENERAL PASSENGER CABIN ILLUMINATION

General passenger cabin illumination is provided by fluorescent tubes fitted in the fuselage ceiling and sidewall. These lights are controlled by control buttons located on the Attendant Panel.

READING LIGHTS

A separate reading light and control is provided above each passenger seat, on the Passenger Service Unit (PSU). For PSU details, refer to Section 2-2–Equipment and Furnishings.

LAVATORY

The lavatory lights are automatically controlled through a microswitch installed in the latch assembly of the door. When the airplane is powered up and the toilet door is open or closed, the lavatory lights turn on in dim mode. If the toilet door is closed and locked, the lavatory lights turn on in the bright mode.

Two illuminated LAVATORY OCCUPIED signs indicate when the lavatory is in use. A RETURN TO SEAT sign in the lavatory illuminates in conjunction with the FASTEN SEAT BELTS sign.

PASSENGER CABIN SIGNS

The passenger warning signs are illuminated signs that will be clearly visible under normal daylight lighting conditions. They provide passengers and flight attendants with NO SMOKING, FASTEN SEAT BELTS, RETURN TO SEAT, and LAVATORY OCCUPIED instructions.

The NO SMOKING and FASTEN SEAT BELTS signs are controlled through respective switches located on the overhead panel. The signs are repeated on every Passenger Service Unit. An aural signal sounds whenever any passenger sign is turned on or off by the pilot. The NO SMOKING and FASTEN SEAT BELTS signs are also activated when the oxygen dispensing units are open. For PSU details refer to Section 2-2–Equipment and Furnishings.

GALLEY LIGHT

The galley light illuminates the galley area between forward and aft galleys. The light is controlled through two buttons, located on the Galley Control Panel. For Galley Control Panel details refer to Section 2-2–Equipment and Furnishings.

STERILE LIGHT (OPTIONAL)

A blue sterile light, located on the cockpit/pax partition, indicates, when lit, that entry into the cockpit is not allowed. It is commanded through a switch located at the overhead panel.

COURTESY AND STAIRS LIGHTING

The courtesy and stair lights provide lighting for safe boarding of crewmembers and passengers. The courtesy and stair lights consist of the main door light (entry area), service door light (galley area), stairway lights and cockpit step light as follows:

- Main door light: A light is installed on the main door ceiling panel, above the entry area of the airplane, to illuminate the stair, entry area, aisle toward cockpit and passenger cabin.
- Service door light: A light is installed on the service door ceiling panel in order to light the galley area.
- Stairway lights: Airplanes equipped with airstair main doors have stair lights installed in each step of the main door stair to provide adequate step illumination.
- Cockpit step light: A red light is installed in the step between the passenger cabin and the cockpit to provides light for safe entry into the cockpit. This light is illuminated simultaneously with the main door light.

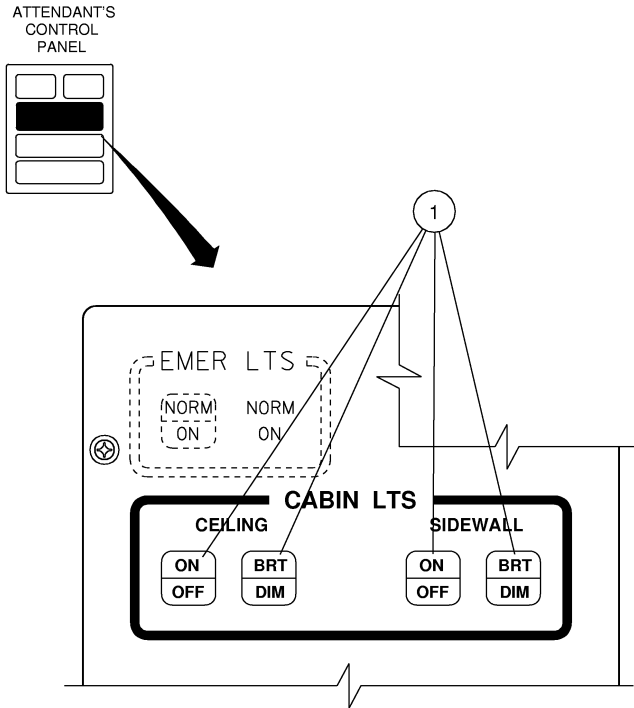
These lights are controlled by a main door microswitch and a control knob, located on the Entrance Panel, above the standard flight attendant seat on the cockpit partition.

CONTROLS AND INDICATORS

ATTENDANT'S PANEL

1 - CABIN LIGHTING CONTROL BUTTONS

- ON - All associated cabin lights are turned on.
- OFF - All associated cabin lights are turned off.
- BRT - All associated cabin lights are set to full brightness.
- DIM - All associated cabin lights are set to reduced brightness.



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ATTENDANT'S PANEL

COURTESY LIGHTING PANEL

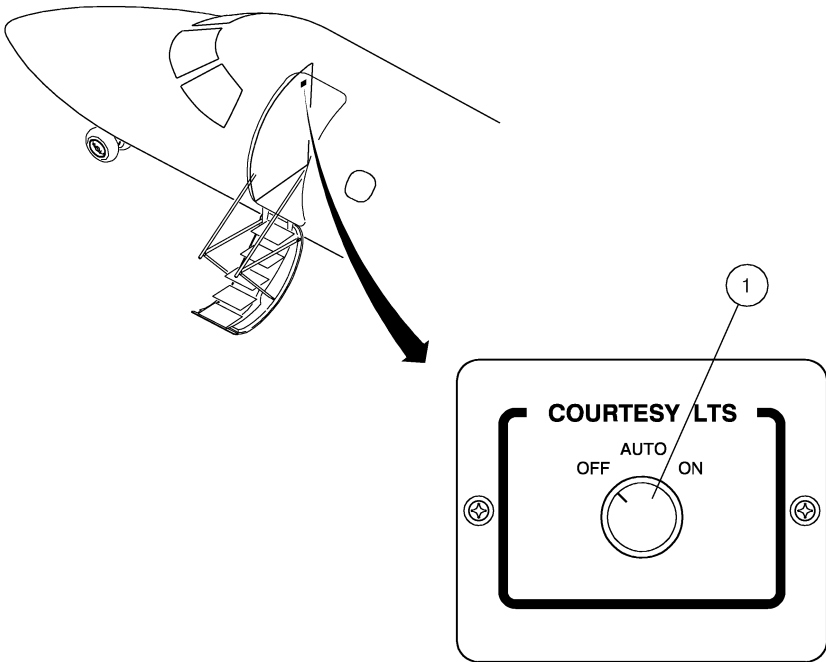
1 - COURTESY AND STAIRS LIGHTING CONTROL KNOB

OFF - All courtesy and stair lights are turned off.

AUTO - All courtesies and stair lights are extinguished when the main door is closed and lit when the main door is open.

NOTE: The cockpit dome lights may be commanded through the Courtesy and Stairs Lighting Control Knob provided the airplane is deenergized and the Cockpit Dome Lights Switch is set to the ON position.

ON - All courtesy and stair lights are turned on, when the main door is open. When the main door is closed, only the overdoor light remains on, to illuminate the main door area in flight.



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COURTESY LIGHTING PANEL

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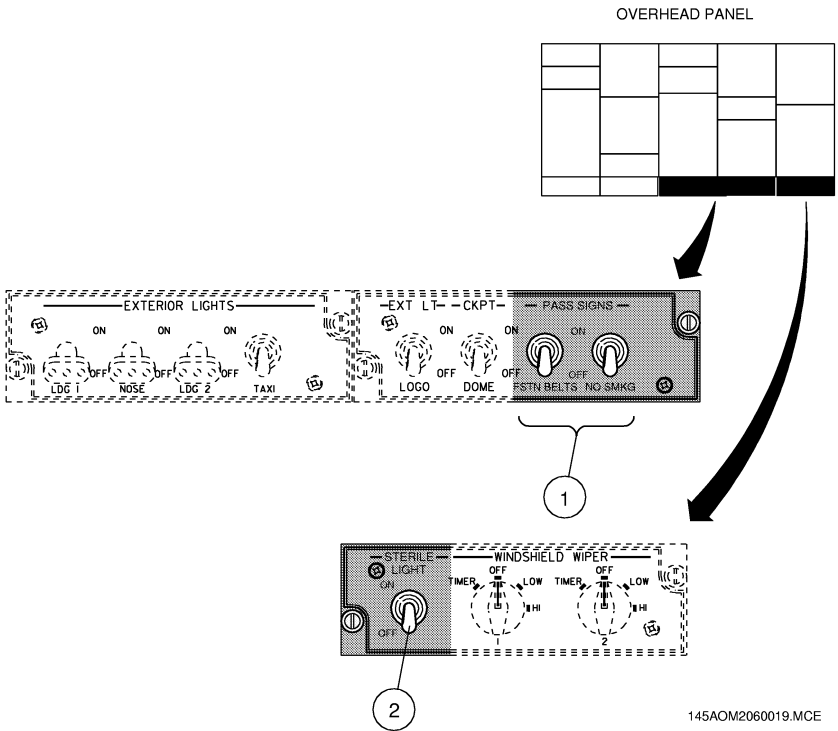
OVERHEAD PANEL

1 - FASTEN SEAT BELTS AND NO SMOKING SIGNS SWITCHES

- Turns on/off the associated passenger signs.

2 - STERILE LIGHT SWITCH

- Turns on/off the sterile light.



OVERHEAD PANEL



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EXTERNAL LIGHTING

The external lights necessary to a proper and safe operation of the aircraft are:

- Landing lights.
- Taxi lights.
- Navigation lights.
- Anti-collision lights.
- Wing inspection lights.
- Logotype lights.

LANDING LIGHTS

The landing lights provide adequate lighting during final approach, flare-out and take-off. Two landing lights are fitted in the wing leading edge close to the fuselage. A third landing light is mounted on the nose landing gear strut. The switches located on the overhead panel are responsible for the control of the landing lights.

TAXI LIGHTS

The taxi light provides sufficient intensity and beam spread to aid pilots during all taxi operation phases, covering the runway and adjacent areas.

Two taxi lights are fitted on the nose landing gear strut and are commanded by a single switch located on the overhead panel.

NAVIGATION LIGHTS

The navigation lights include two red navigation lights at the left wingtip, two green navigation lights at the right wingtip, and two white navigation lights at the tail boom. Some airplanes are equipped with four white navigation lights.

Unlike the other models, the EMB-145XR is equipped with two white navigation lights installed at the trailing edge of either wing.

The navigation lights are controlled by means of the NAV LT switch, located on the overhead panel. This switch turns on one lamp at each wingtip and two lamps at the tail boom.

In case a green or red light becomes inoperative, the standby wingtip lamps are activated through a switch located on the cockpit maintenance panel.



On airplanes equipped with four white navigation lights, in case one or both of the tail navigation lights in use become(s) inoperative, the relevant standby tail lamps are activated through a switch located on the aft ramp hail panel.

ANTI-COLLISION LIGHTS

The anti-collision lights provide illumination for visual recognition and collision avoidance during all flight/taxi operations. White strobe (anti-collision) lights are fitted to each wing tip and cone top of the horizontal stabilizer. The EMB-145XR, in its turn, is provided with only two white strobe lights, which are located at the winglets.

Red beacon lights are mounted on the upper and lower fuselage. Two different switches, one for strobe lights and another for the red beacon lights are located on the overhead panel.

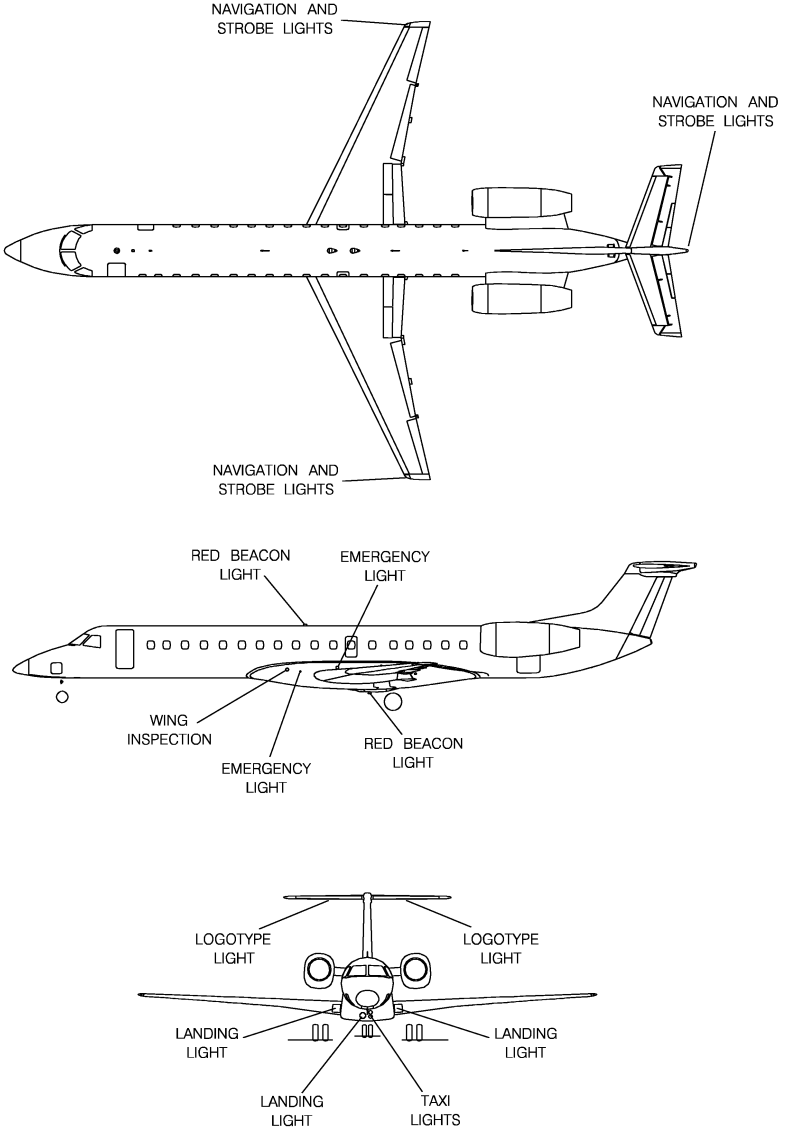
WING INSPECTION LIGHTS

Two inspection lights, one on each side of the fuselage, provide lighting of the wing leading edge to allow the crew to verify ice formation. The inspection lights are controlled by a switch located on the overhead panel.

LOGOTYPE LIGHTS

The logo lights are installed on the underside of the horizontal stabilizer and are aimed at the vertical fin. They provide adequate illumination of the airplane's logo during operation on the ground and in flight. A switch located on the overhead panel controls the logotype lights.

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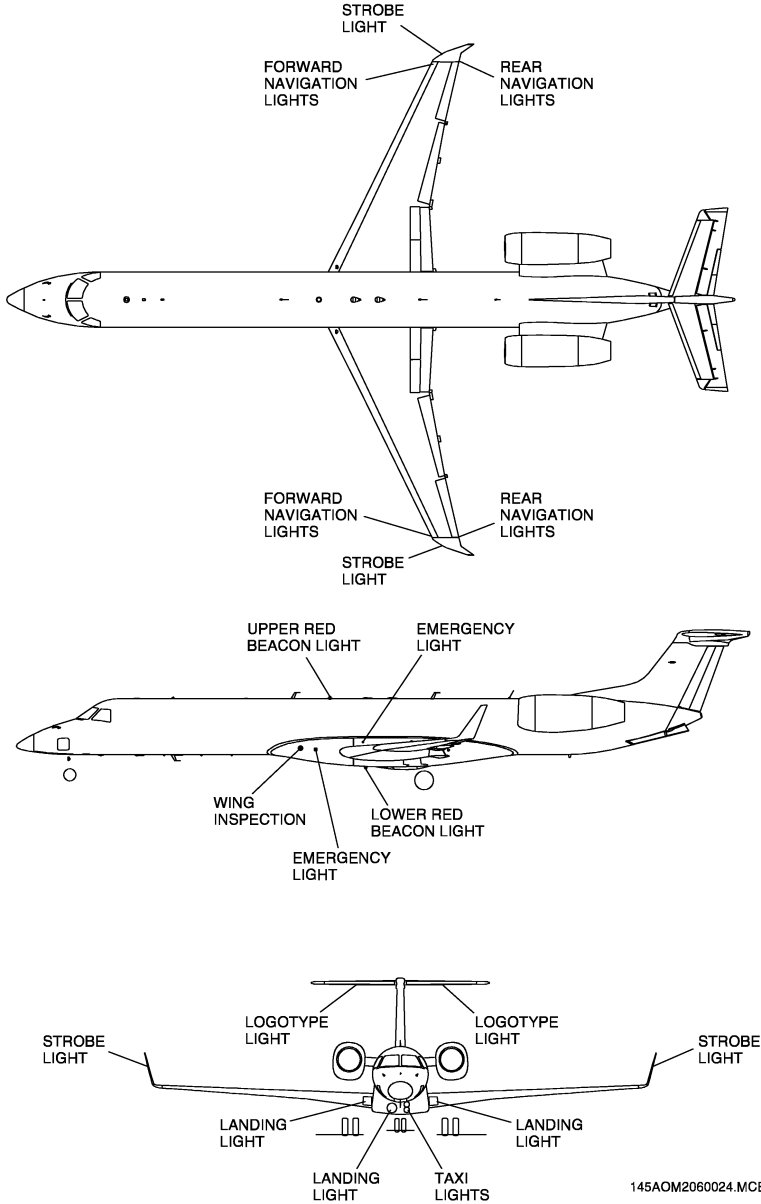
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EXTERNAL LIGHTS - EMB-135/140/145 (EXCEPT EMB-145XR)

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EXTERNAL LIGHTS - EMB-145XR

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SERVICE COMPARTMENTS LIGHTING

The system provides lighting in the service compartments for quick inspection and accomplishment of several tasks. Service lights are installed in the nose landing gear, rear and forward electronic bays, tail cone and forward flight control compartments. The lights are controlled by a door micro-switch, that turns on the associated light when the access doors is open, or by dedicated switches, installed in the compartment.

BAGGAGE COMPARTMENT LIGHTING

The baggage compartment is equipped with three lights installed on the ceiling panel. The baggage lights operate according to the following conditions:

- They come on automatically whenever the cargo door is open, and they go off when the door is closed. For airplanes equipped with a push-button installed on the lavatory, it is possible to turn on the baggage lights in flight to allow visual inspection of the baggage compartment through a inspection sight glass located in the baggage compartment/lavatory partition.

OR

- They come on automatically when the aircraft is energized and they remain on until the aircraft is deenergized.

Some airplanes are optionally equipped with a cargo door light installed in the left pylon that provides external lighting of the baggage compartment. The light is automatically turned on when the baggage compartment door is open.

CONTROLS AND INDICATORS

OVERHEAD PANEL

1 - NAVIGATION, RED BEACON, STROBE AND WING INSPECTION LIGHTS SWITCHES

- Turns on/off the associated light.

2 - LOGOTYPE LIGHTS SWITCH

- Turns on/off the logotype lights.

3 - TAXI LIGHTS SWITCH

- Turns on/off the taxi lights.

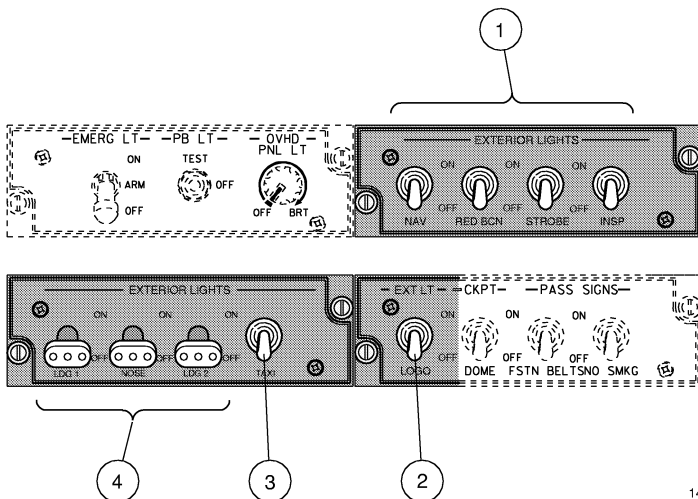
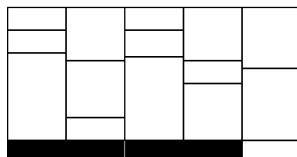
NOTE: Taxi lights are not turned on if nose landing gear is not down and locked, regardless of the Taxi Lights Switch position.

4 - LANDING LIGHTS SWITCHES

- Turn on/off the associated landing light.

NOTE: Nose landing light is not turned on if nose landing gear is not down and locked, regardless the of Nose Landing Light Switch position.

OVERHEAD PANEL



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OVERHEAD PANEL



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EMERGENCY LIGHTING

The emergency lighting consists of internal and external lights that provide proper illumination for emergency cabin evacuation. These lights are powered by four dedicated batteries charged through the Essential Bus. Batteries power is sufficient to supply all internal and external emergency lights for approximately 15 minutes.

The exterior emergency lights installed are as follows:

- Two lights installed on each side of the wing-to-fuselage fairing in order to illuminate the wing escape route and the ground area.
- One emergency light installed in the main door and in the service door provides illumination of the external main door and service door areas, when the door is open.

Internal emergency lights consist of the cockpit light, aisle lights, main door lights, galley service door lights, overwing emergency exit lights, floor proximity lights and EXIT signs as follows:

- Cockpit light: This light is located on the cockpit ceiling to provide general cockpit emergency illumination.
- Aisle lights: Four dome lights are located along the aisle for general emergency cabin illumination.
- Main door, galley service door and overwing emergency exits lights: Four lights are installed for the purpose of illuminating the passageway leading from the main aisle to each of the exit openings.
- Floor proximity emergency lights: Either electroluminescent or photoluminescent strips are installed along the passenger cabin floor to provide a means of identifying the emergency escape path even in conditions of dense smoke.

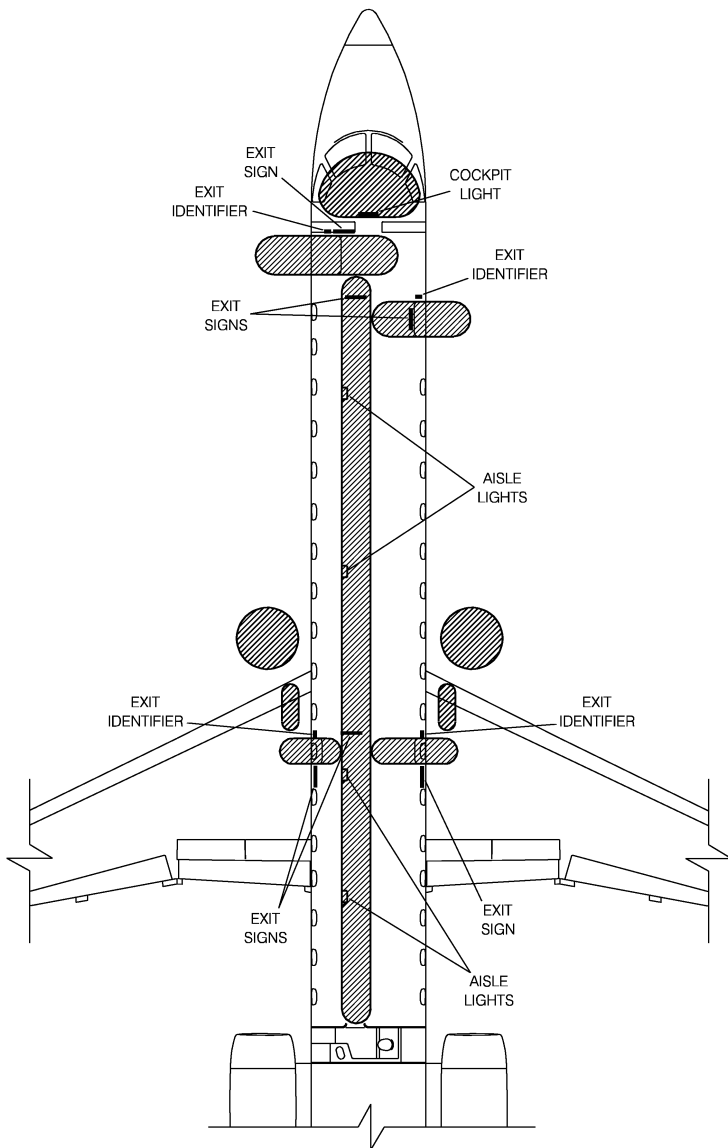
NOTE: Photoluminescent escape path system strips must be charged prior to the first flight of the day. Charging is provided by the interior cabin lighting being the charging time defined by the table below. It should be pointed that during such time, cabin activity is limited to minor aisle traffic of crew and personnel and that operational duration is not limited if daylight ambient conditions exist throughout flight or if cabin lighting is operated on the ON or BRIGHT settings.

Charge	Bin door position	Charge duration (minutes)	Operational duration (when lights are extinguished)
Initial	Closed	15	4.75 hours
		30	6.5 hours
Subsequent	Closed	15	6.75 hours
		30	9 hours
	Open	30	5 hours

– Illuminated EXIT signs: They are installed near each door and emergency exits.

Emergency lighting is controlled through the Emergency Lighting Switch, located on the overhead panel, and through the Attendant Emergency Lighting Button, located on the Attendant's Panel.

A caution message is presented on the EICAS if the system is not armed.



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AREA ILLUMINATED BY EMERGENCY LIGHTING

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EICAS MESSAGE

TYPE	MESSAGE	MEANING
CAUTION	EMERG LT NOT ARMD	Emergency lighting system is not armed.

CONTROLS AND INDICATORS

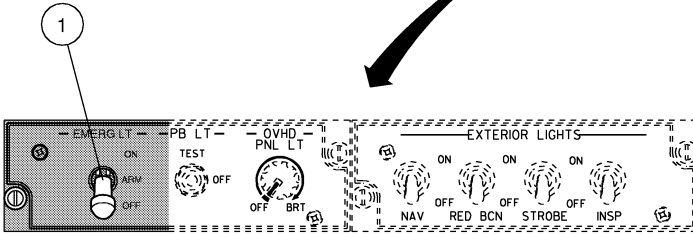
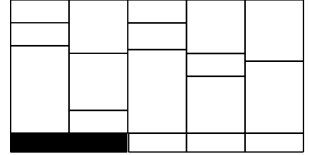
OVERHEAD PANEL

1 - EMERGENCY LIGHTING SWITCH

- ON - Emergency lights illuminate with power supplied by the dedicated batteries.
- ARM- Emergency lights are in standby mode (lights turned off and the batteries being charged) and illuminate automatically in case of an electrical emergency, with power supplied by the dedicated batteries.
- OFF - Emergency lights are turned off. Emergency lighting dedicated batteries are not charged.

NOTE: The emergency lights are controlled by the Emergency Lighting Switch when the Attendant Emergency Lighting Button, on the Attendant's Panel, is in the NORM mode.

OVERHEAD PANEL



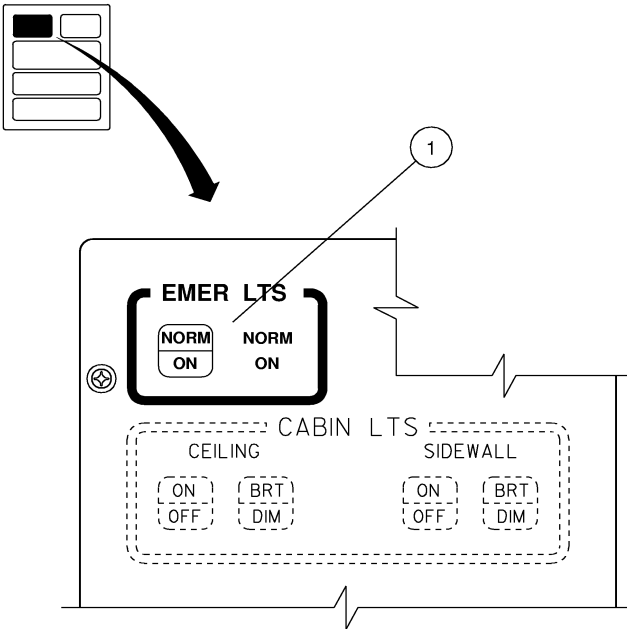
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ATTENDANT'S PANEL

1 - ATTENDANT EMERGENCY LIGHTING CONTROL BUTTON

- NORM - Emergency lights remain in the mode selected by Emergency Lighting Switch position in the cockpit.
- ON - Emergency lights are turned on with power supplied by dedicated batteries, regardless of Emergency Lighting Switch position on the cockpit.

ATTENDANT'S
CONTROL
PANEL



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ATTENDANT'S PANEL

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