CHAPTER 52 - DOORS

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GENERAL

There are doors for personnel access and to perform tasks, such as cargo loading or airdropping.

The aircraft has the following doors:

- ***Crew Door:*** allows flight crew to access the airplane.
- ***Paratroops Doors:*** enable paratroops dropping.
- ***Emergency Door:*** provides the aircraft with an additional evacuation exit in case of emergency.
- ***Cockpit Windows:*** provide the cockpit with additional evacuation exits in case of emergency.
- ***Cockpit Door:*** allows to isolate the cockpit from the cargo cabin.
- ***Ramp and Cargo Door (Ventral Door):*** allow cargo loading/unloading, personnel access/exit, and cargo/paratroops airdropping.
- ***Nose-Gear Doors:*** prevent nose landing gear from any damage, and decrease drag while on flight.

The aircraft includes a doors warning system, to inform the flight crew about doors status. Some doors have also a built-in mechanical indication about their own lock/unlock status.

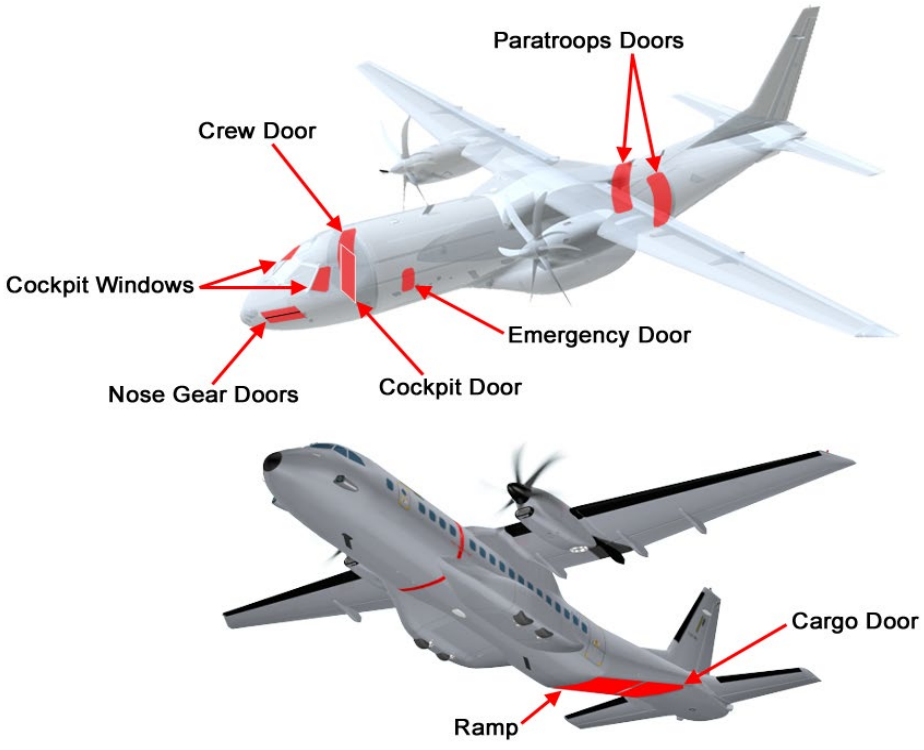

Figure 52-1 Doors - Components

CREW DOOR

The aircraft has a crew door, that opens outwards, at the right fore fuselage.

DESCRIPTION

The main components are:

- ***Door:*** it has latches, at both sides, to secure the door and four steps. Also, four inspection windows allow latches lock-position visual checking.
- ***Open/Close Device:*** consists of two handles external/internal, connected by linking rods, allowing latch actuation device driving.
- ***Ribbon:*** allows to smoothly open the crew door, or to close it from inside the cargo cabin.

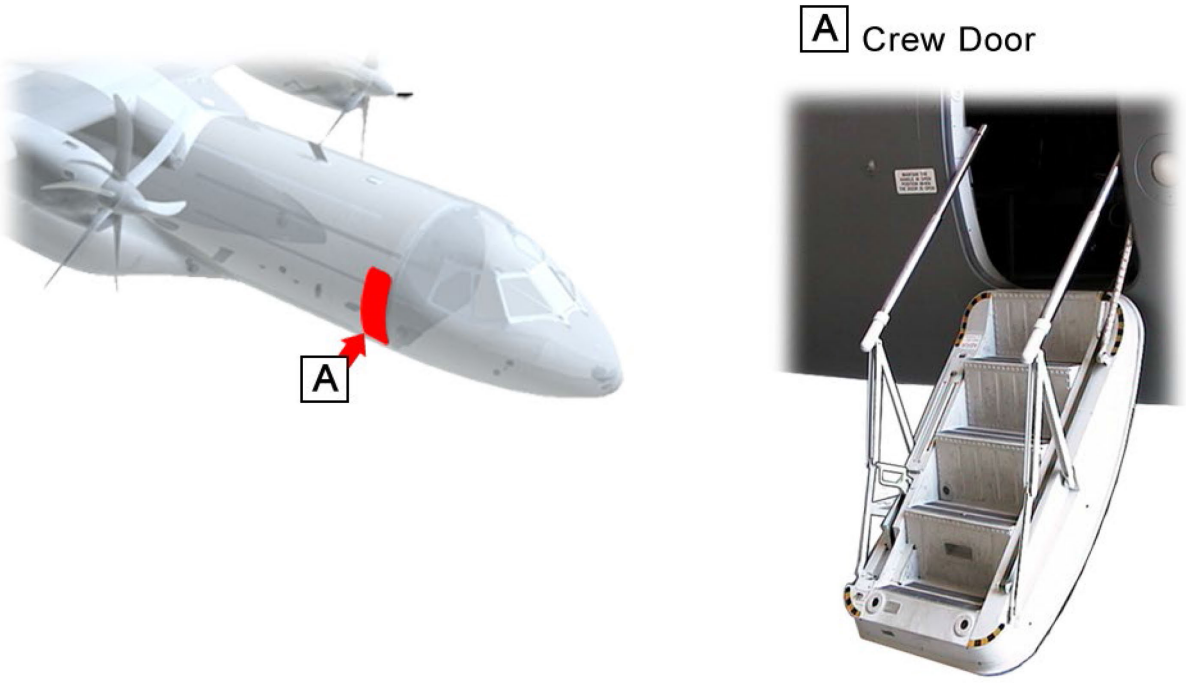

Figure 52-2 Crew Door - Components

OPERATION

WARNING

Before operating the crew door, ensure the aircraft is completely depressurized.

The crew door is closed from inside by pulling the attached ribbon, or from outside the aircraft by raising the door. Once closed, push the interior or exterior handle to engage the latches with fuselage frame. When the latches are fully engaged, they operate the micro-switches of the door warning system and the pressurization system.

CONTROLS AND INDICATORS

(1) Ribbon

(2) Inspection Windows:

- *LOCKED (green):* latch locked.
- *UNLOCKED (red):* latch unlocked.

(3) Interior Handle:

- *Pulled:* retracts the latches.
- *Pushed:* engages the latches.

(4) Exterior Handle:

- *Pulled:* retracts the latches.
- *Pushed:* engages the latches.

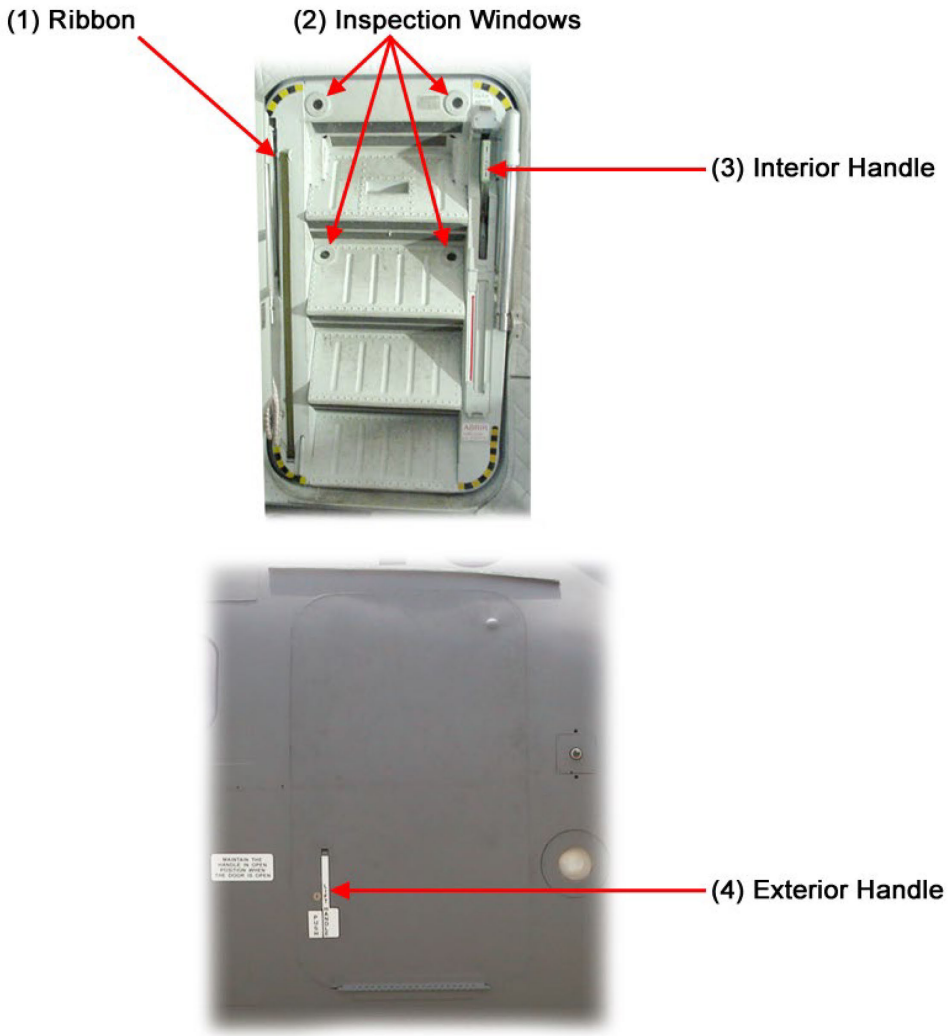

Figure 52-3 Crew Door - Controls and Indicators

PARATROOPS DOORS

The aircraft has two paratroop doors located at each side of the rear fuselage.

DESCRIPTION

The main components are:

- ***Doors:*** each door has two sections (upper and lower), both opening inwards. Top section can be opened/closed from either outside or inside the aircraft. A guide rail and a pin, at the rear end, hold the door in its stowing position.
- ***Open/Close Device:*** each door section has a locking system furnished with rods and latches that lodge in fuselage door frame pits. Upper door locking device includes two handles (one exterior and another interior) both linked by a rod, to drive the latches on either side of the door. The interior one can be fitted with a safety pin that locks it. Lower door locking device includes a handle for latches-driving by means of an actuator rods set.

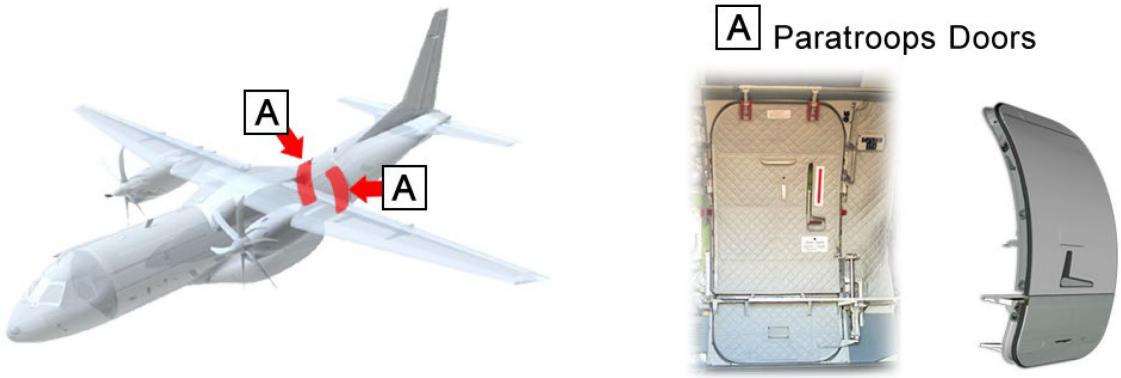

Figure 52-4 Paratroops Doors - Components

OPERATION

CAUTION

The opening of the left paratroop door can cause damage or interference with equipments connected in the sockets next to ATTENDANT CONTROL panel.

To open the door, pull the upper interior handle or turn the exterior handle. This forces the upper door inwards and it turns until bumping the lower rail. Once in this position, the door can be moved to its stowage place in the ramp zone, where a latching pin, installed in the rail, locks it into place. It is not possible to start opening the lower door until the upper door is fully locked in its stowing position

Lower door is opened by driving the lower interior handle to retract lateral latches. Then the door is vertically raised, supported by both lateral guide rails and a cylindrical rod, until safety latch locks at travel end. In this arrangement, the door can turn 180º around the cylindrical rod, to the stowing position in the upper door, where a hook holds it in place.

To close the door, repeat the opening sequence in reverse order. Release the hook that secures the lower door to the upper door. Until the lower door section is in its position and the latches are secured, it will not be possible to move the upper door section, because there is another bolt, driven by the rear latch of the lower door.

To close the upper door, press down the pedal placed at the rail to release the securing pin in the stowing position. Then repeat the opening sequence in reverse order, taking special care of door lateral levers to be well positioned in door frame guide rails, to fit the door into the fuselage.

CONTROLS AND INDICATORS

(1) Upper Interior Handle:

- *Pulled:* retracts the upper door latches.
- *Pushed:* engages the upper door latches.

(2) Lower Interior Handle:

retracts the lower door latches.

(3) Exterior Handle:

- *Turned counter clockwise:* retracts the upper door latches.
- *Turned clockwise:* engages the upper door latches.

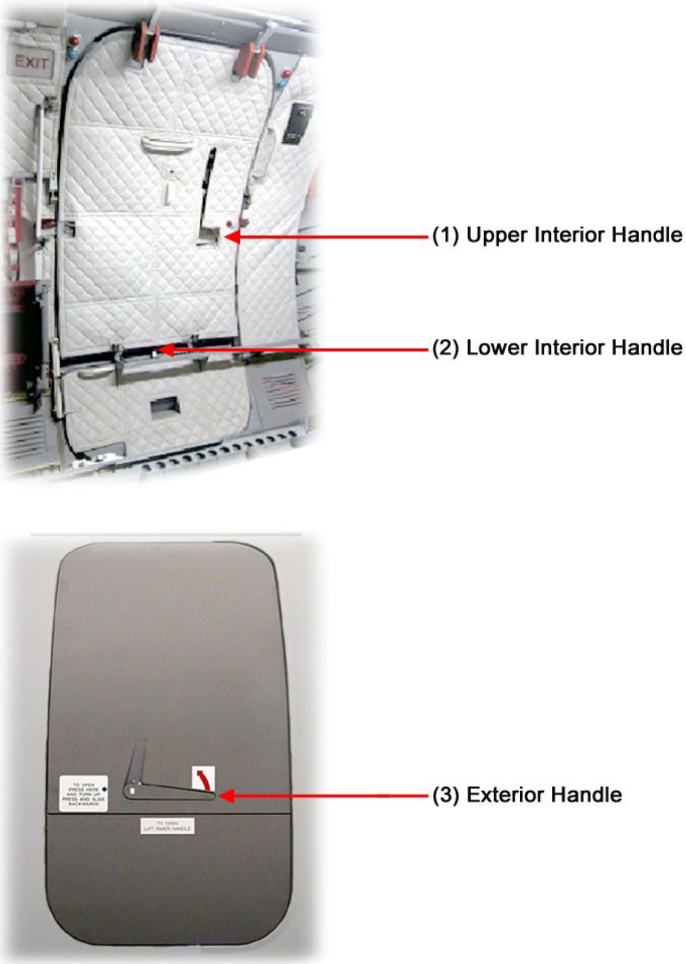

Figure 52-5 Paratroops Doors - Controls and Indicators

EMERGENCY DOOR

Although every door can be used in emergency situations, there is a clearly-marked, inward-opening emergency exit door at the forward LH fuselage, located in front of the crew door.

DESCRIPTION

The main system components are:

– ***Door:*** it has latches to secure the door and a window.

– ***Open/Close Device:*** two handles (one exterior and another interior), allowing latches operation. The interior one can be fitted with a safety pin that locks it.

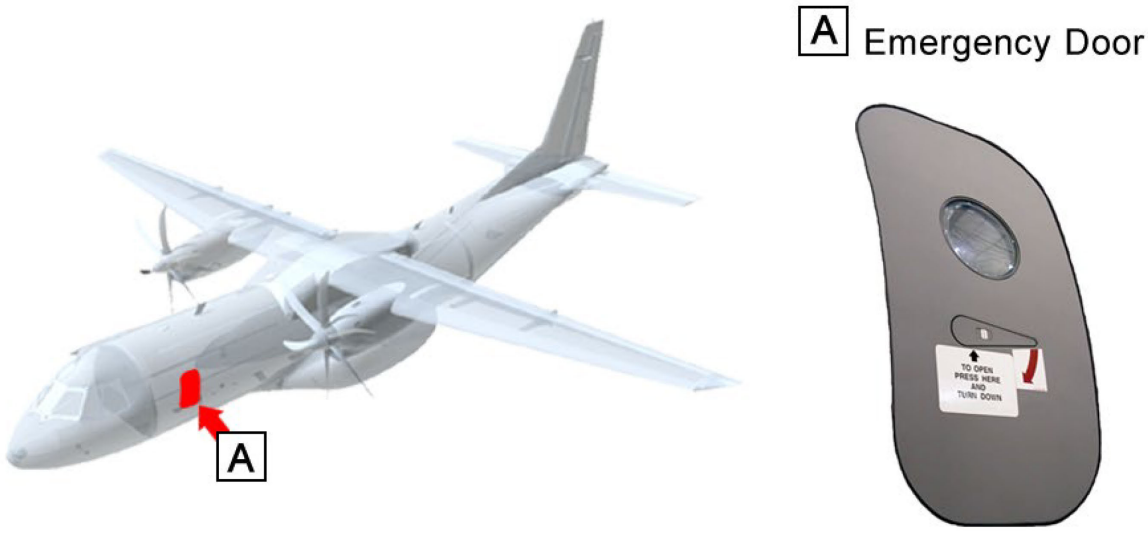

Figure 52-6 Emergency Door - Components

OPERATION

To open the emergency door, turn the interior handle and pull the emergency door, or turn the exterior handle and push the emergency door.

To close the emergency door, repeat the opening sequence in reverse order. Once closed, and latches are engaged, inner handle is fastened to the door by a metal strip, to be secured by means of a sealed wire.

CONTROLS AND INDICATORS

(1) Interior Handle:

- *Turned counter clockwise:* retracts the latches. Handle flattening-device must be released before using.
- *Turned clockwise:* engages the latches.

(2) Exterior Handle:

- *Turned clockwise:* retracts the latches.
- *Turned counter clockwise:* engages the latches.

Figure 52-7 Emergency Door - Controls and Indicators

COCKPIT WINDOWS

The windows open inward and are located at each side of the cockpit. They are also designed as an emergency exit.

DESCRIPTION

The main system components are:

- ***Sliding Window***
- ***Handle:*** located in the lower side of the sliding window, allows opening or closing the window.
- ***Rope:*** located in the rope container, over each sliding window, provides an object to hold on and reach the ground safely.

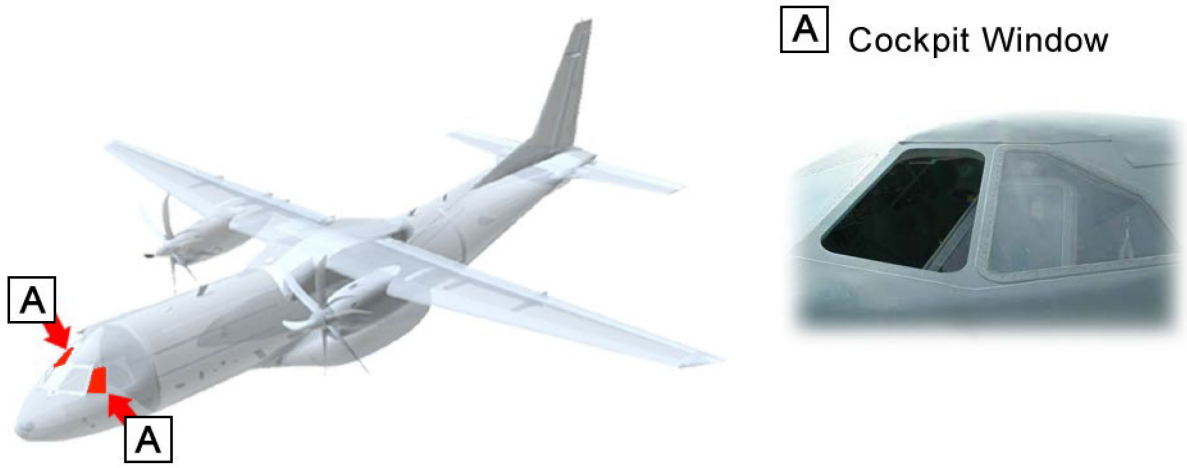

Figure 52-8 Cockpit Windows - Components

OPERATION

To open the cockpit window, turn the handle (clockwise in the left window and anticlockwise in the right window) and move the sliding window rearward. If necessary, pull out the rope.

To close the cockpit window, repeat the opening sequence in reverse order, making sure that it is fully closed.

CONTROLS AND INDICATORS

(1) Sliding Window

(2) Rope Container

(3) Rope

(4) Handle:

- *Twisted:* allows locking or unlocking the cockpit window.

Figure 52-9 Cockpit Windows - Controls and Indicators

RAMP AND CARGO DOOR (VENTRAL DOOR)

Ventral door is divided in ramp and cargo door, both are located at the rear fuselage. Ramp opens downward and cargo door opens upward.

DESCRIPTION

The main components are:

- ***Cargo Door (upper section):*** located in the rear part of the cargo cabin, opens upward and it is operated by means of a hydraulic actuator.
- ***Ramp (lower section):*** located in the rear part of the cargo cabin, opens downward and it is operated by means of two hydraulic actuators. Each actuator has a ramp lock actuator, that, when locked, stops its movement when the ramp is horizontal. While on ground operations, it can be opened beyond the horizontal position allowing using it as ramp for loading/offloading operations.

CAUTION

Ramp lock actuators can be operated only with the ramp closed and locked, and they must be in the same position before opening it.

To secure the ramp closed, there are eight hydraulic hooks, four at each side. Also, four inspection windows allow hooks lock-position visual checking.

- ***HYDR UTILITY CONTROL Panel:*** located in the cockpit, enables system management and monitoring.
- ***ATTENDANT CONTROL Panel:*** located in the cargo cabin, enables system management and monitoring.
- ***Remote Control Socket:*** located in the right side of the rear fuselage, next to the ramp, it allows to connect the winch control to operate the ramp and cargo door from outside the aircraft.

Figure 52-10 Ramp and Cargo Door (Ventral Door) - Components

OPERATION

CAUTION

During heavy rain conditions, if the ramp latches are not covered when the ramp is open, water might enter into the ramp structure and increase corrosion development. Cover the ramp latches.

Depending on the position of the OPR SEL selector, the ramp and cargo door can be controlled from the HYDR UTILITY panel, located in the cockpit overhead panel, or from the ATTENDANT CONTROL panel, located in the left side of the rear cargo cabin. Nevertheless, ramp and cargo door can also be controlled from outside the aircraft using a remote control plugged into the remote control socket.

CAUTION

In flight, ramp extension beyond the floor line is hazardous. So, prior to ventral door operation, ensure RAMP CYL ON is on.

When controlled from the cockpit, ramp and cargo door are jointly operated, following the automatic opening sequence: cargo door is opened, hooks are released and the ramp is opened. Closing sequence is as follows: ramp is closed, hooks are locked and cargo door is closed.

NOTE

On ground, it is recommended to operate ramp and cargo door from the rear ATTENDANT CONTROL panel.

When controlled from the cargo cabin, ramp and cargo door can be operated in two different modes:

– ***Automatic:*** enables the aforementioned automatic sequence. It also enables the right side of the remote control socket, so the winch control can be connected and the ramp and cargo door are jointly operated, following the automatic opening or closing sequences.

– ***Manual:*** the ramp and cargo door can be separately operated.

CAUTION

If the ramp is fully closed and is going to be operated in manual mode, set the CLOSE/OPEN selector to the close position before you open it to prevent damage to the hooks of the ramp.

CONTROLS AND INDICATORS

(1) HYDR PRESS Pushbutton:

- *Pressed (ON light on):* if at least one hydraulic pump is connected, turns on the ramp and cargo door system.

(2) OPR SEL Selector:

- *PLT:* ramp and cargo door are operated from the cockpit.
- *CARGO:* ramp and cargo door are operated from the cargo cabin.

(3) RAMP CYL Indicator:

- *ON light on:* both ramp lock actuators are locked.

(4) OPEN/UNLKD Indicator:

- *OPEN light on:* cargo door and ramp are fully opened (or ramp at horizontal position if the ramp lock actuators are locked).
- *UNLKD (amber) light on:* cargo door and ramp are not completely closed.

(5) OPEN/CLOSE Selector:

- *OPEN:* automatic opening sequence is performed.
- *CLOSE:* automatic closing sequence is performed.
- *OFF:* no action is performed.

(6) PRESS/ON Indicator:

- *PRESS ON light on:* HYDR PRESS pushbutton has been pressed and the system is on.

(7) CYL/SW Indicator:

- *CYL light on:* both ramp lock actuators are locked.
- *SW (amber) light on:* at least one hook or pressurization detection micro-switch (ramp) is activated with ramp open (micro-switch fails).

(8) CARGO Indicator:

- *OPEN light on:* cargo door is fully opened.
- *UNLKD (amber) light on:* cargo door is not completely closed.

(9) RAMP Indicator:

- *OPEN light on:* ramp is fully opened (or at horizontal position if the ramp lock actuators are locked).
- *UNLKD (amber):* ramp is not completely closed.

(10) CLOSE/OPEN Selector:

- *CLOSE:* depending on RAMP/CARGO DOOR selector position, closes ramp or cargo door.
- *OPEN:* depending on RAMP/CARGO DOOR selector position, opens ramp or cargo door.

(11) RAMP/CARGO DOOR Selector:

- *RAMP:* CLOSE/OPEN selector controls ramp.
- *CARGO DOOR:* CLOSE/OPEN selector controls cargo door.

(12) AUTO/MAN Selector:

- *AUTO:* ramp and cargo door are opened or closed in automatic sequence. It also enables the remote control socket.
- *MAN:* ramp and cargo door are opened or closed independently.

(13) RAMP-CARGO DOOR CLOSE/OPEN Selector:

- *OPEN:* automatic opening sequence is performed.
- *CLOSE:* automatic closing sequence is performed.

(14) Ramp Lock Actuators:

moved downwards and turned: the ramp can be opened up to the horizontal position.

(15) Inspection Windows:

- *LOCKED:* hooks locked

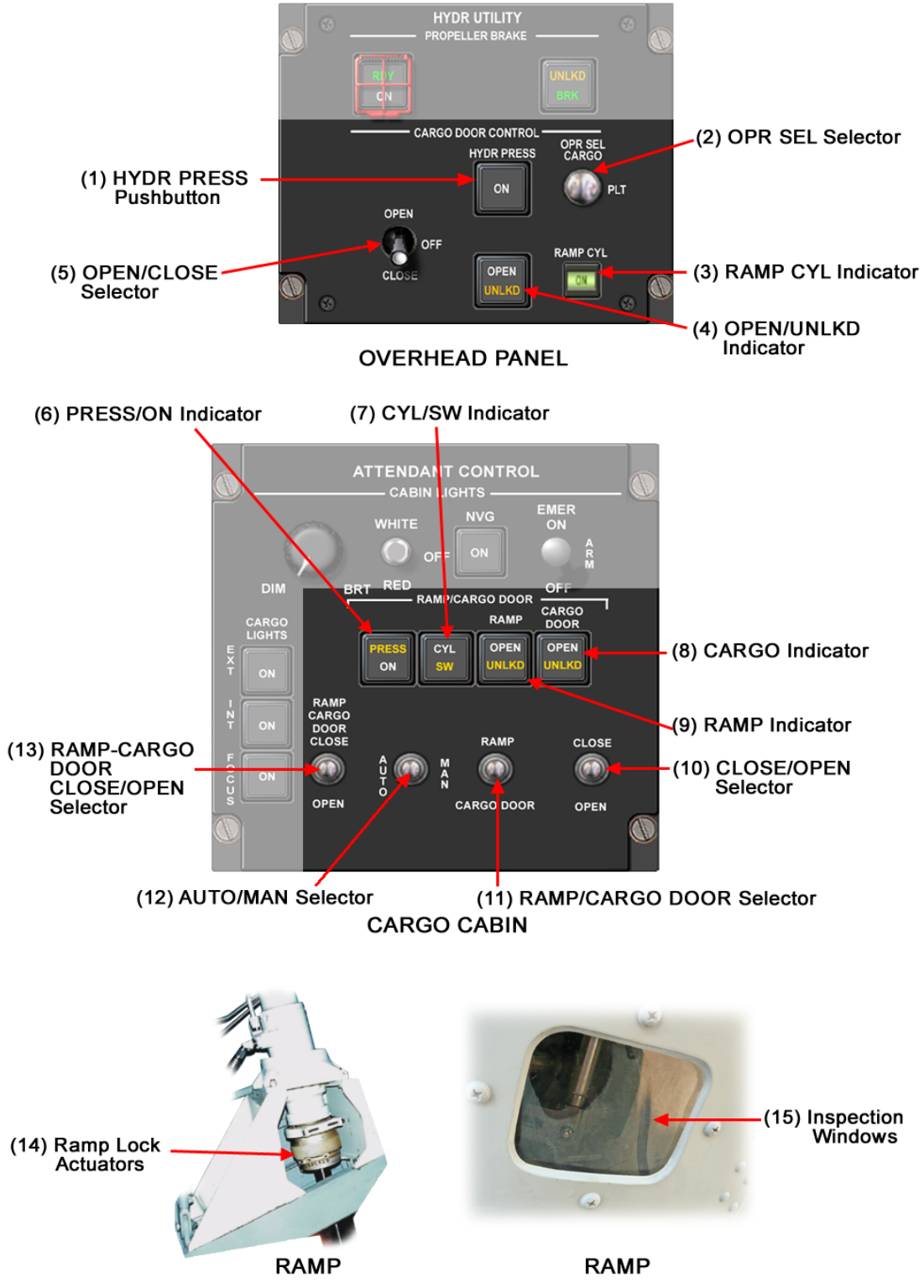

Figure 52-11 Ramp and Cargo Door (Ventral Door) - Controls and Indicators

COCKPIT DOOR

The cockpit door isolates the cockpit from the cargo cabin, and a key lock allows to lock it from outside.

DOORS WARNING SYSTEM

The doors warning system provides the crew with visual and acoustic indication of aircraft doors status (lock/unlock).

DESCRIPTION

Main components are:

– ***Micro-switches:***

  • *Crew door:* two microswitches provide door locked signal (allow aircraft pressurization) and two provide door open signal.

  • *Emergency Door:* one microswitch provides door locked signal and another one provides door open signal.

  • *Paratroop Doors:* one microswitch provides door locked signal and another one provides door open signal.

  • *Ramp:* two microswitches provide ramp locked signal (allow aircraft pressurization) and two provide ramp open signal.

– ***EXT DOORS Control Panel:*** located at the central instrument panel, enables system management and monitoring.

OPERATION

When a door is not completely locked, the DOOR UNLK warning annunciator is displayed in the IEDS. If the unlocked door is the crew door or the ramp, the pressurization system is turned off.

When a door is opened, the related annunciator is turned on in the EXT DOOR control panel.

To verify the operation of the annunciators in the EXT DOOR control panel, there is a test button.

The system also checks the status of the ramp microswitches.

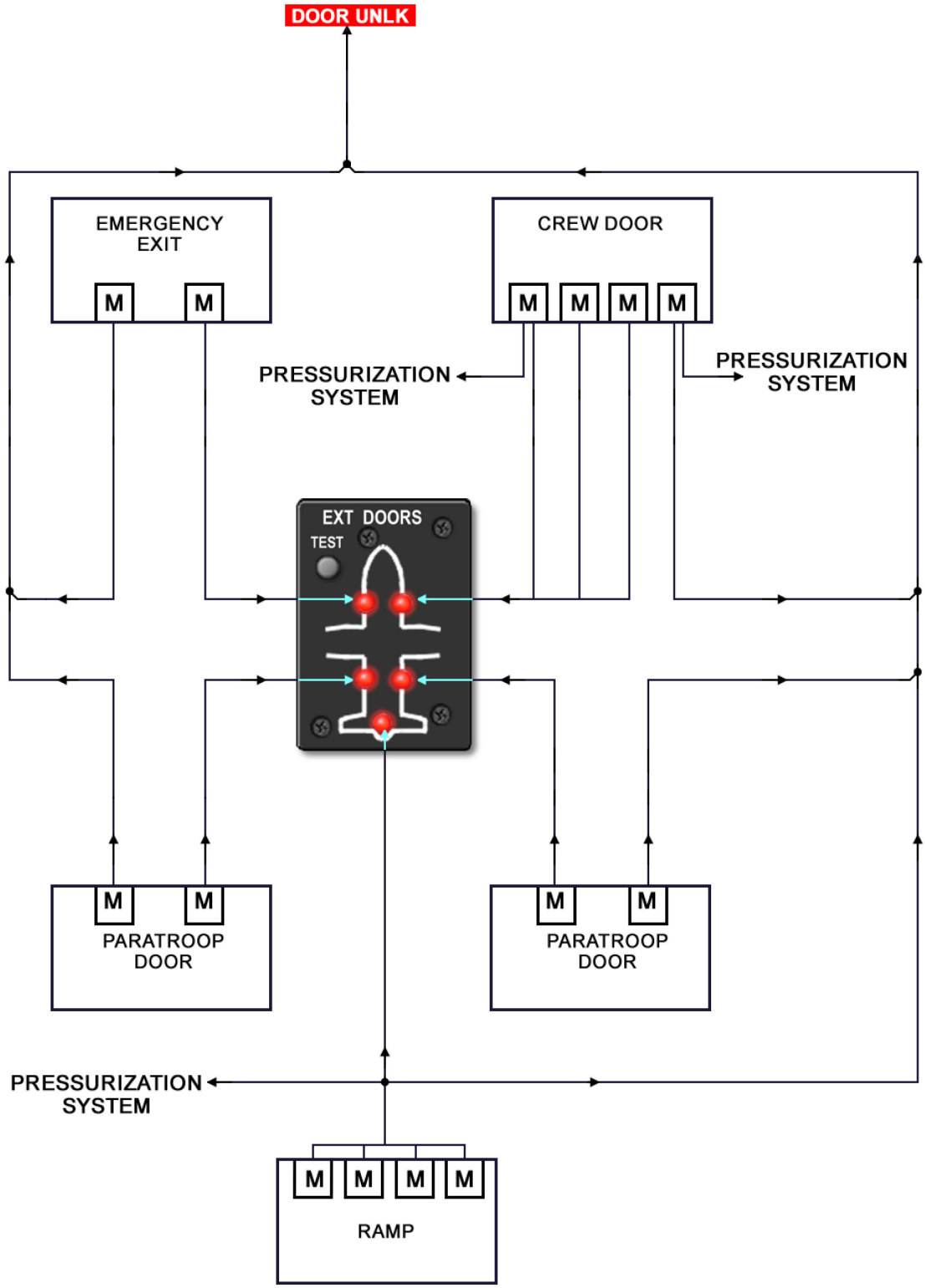

Figure 52-12 Doors Warning System - Architecture

CONTROLS AND INDICATORS

(1) EXT DOORS Indicators:

- *On:* related door is opened.

(2) TEST Button:

- *Pressed:* verifies indicators status on EXT DOORS panel.

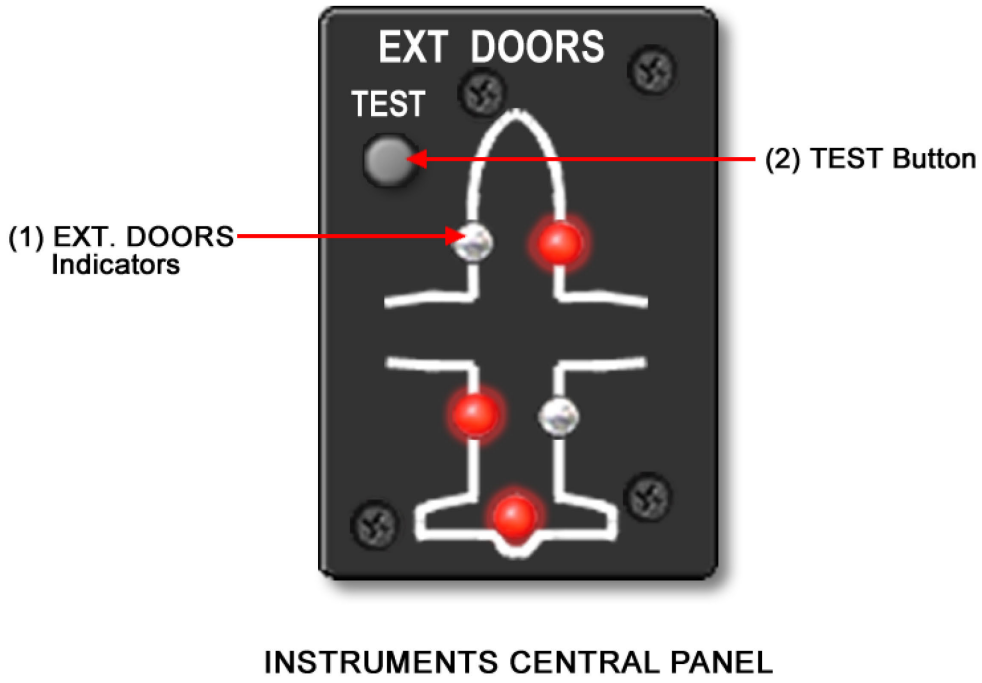

Figure 52-13 Doors Warning System - Controls and Indicators

NOSE GEAR DOORS

Nose gear doors are intended to protect nose landing gear, and reduce drag while gear is retracted.