

Gulfstream IV

OPERATING MANUAL

DOORS

2A-52-10: General

1. Fuselage Doors:

The Gulfstream IV is fitted with doors for access to the pressurized and unpressurized sections of the fuselage. Doors installed in the pressurized section are equipped with seals that maintain airplane pressurization integrity. For the doors in the unpressurized section, no seals are required and use of these doors is restricted to ground operations.

A. Pressurized Section Doors:

The following doors and openings are fitted into the pressurized section of the airplane fuselage:

- Main entrance door
- Baggage compartment door
- Cargo door (optional installation)
- Emergency exit windows

B. Unpressurized Section Doors:

The following doors and openings are fitted into the unpressurized section of the airplane:

- Tail compartment door
- Service access doors

2. Door Controls and Indications:

The main entrance door and the optional cargo door are hydraulically powered through switch selections on the respective control panels. Each control panel has appropriate indicators for operating the door. The remaining doors in the pressurized and unpressurized areas of the fuselage are manually operated.

All doors are monitored by door warning circuits that provide indications to the cockpit if the doors are not closed and locked or latched.

2A-52-20: Fuselage Doors

1. Pressurized Section Doors:

The pressurized section of the fuselage is equipped with a main entrance door, a baggage compartment door, overwing emergency exits, and at customer option, a cargo door fitted into the fuselage forward of the right wing leading edge. See Figure 1 and Figure 2. All doors that are used in normal operations are equipped with inflatable seals around the circumference of the doors. The seals are inflated by pneumatic pressure from the airplane bleed air manifold to seal the opening around the doors to preserve cabin pressurization integrity. The overwing emergency exits are plug type openings with fixed non-inflatable seals designed to allow removal of the exits inward when the airplane is not pressurized (on the ground).

A. Main Entrance Door:

The main entrance door, shown in Figure 3, is located on the forward section of the left fuselage approximately midway between the cockpit and the wing leading edge, and is the primary access to the airplane. The thirty-

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six (36) inch by sixty-two (62) inch door is hinged at the bottom and is equipped with a folding stairway and handrails integrated into the interior of the door structure. The outside of the door conforms to the curvature of the fuselage and is manufactured in a similar manner to the fuselage, with ribs and a covering metallic skin. The integrated stairway folds at mid-point, allowing the stairs to extend from the entranceway threshold to just above ground level. The handrails unfold as the stairway extends, locking into position at full stairway extension. When the main entrance door is closed, the handrails unlock and the stairway folds into a secured position against the interior of the door.

The door is closed hydraulically, using pressure supplied by the auxiliary hydraulic system that is reduced for door operation to 1400 psi (\pm 100) by a reducing valve in the door lines. The door is opened manually, with the weight of the door and attached stairway rotating the door assembly out and down by free fall. The door opening rate is moderated by a restrictor in the hydraulic lines that uses trapped fluid as a brake to slow door and stairway operation.

Door operation may be controlled from either inside or outside of the airplane. The mechanical door latches and locks are interconnected, so that operating either the inside or outside handles also moves the other. The electrical circuitry for closing the door is similarly interconnected, so that either inside or outside controls may close the door.

To close the door from outside, switches within a covered door control panel, located under the door beneath the oxygen servicing panel, are used to power the Essential DC bus and auxiliary hydraulic system to retract the stairway and close the door. A BATT SWITCH within the panel is selected ON to power the Essential DC bus and the auxiliary hydraulic system on airplanes Serial Number (SN) 1000-1155. The OUTSIDE DOOR SWITCH is then positioned to CLOSE to retract the stairway and close the door. On airplanes SN 1156 and subsequent, the OUTSIDE DOOR SWITCH will automatically power the Essential DC bus and auxiliary hydraulic system, and there is no need to turn on the BATT SWITCH to operate the door.

NOTE:

On airplanes SN 1000-1155, the external BATT SWITCH must be turned OFF after the door is closed to prevent draining the airplane batteries.

To close the door from inside the airplane, a DOOR SAFETY SWITCH on the lower outside of the pilot circuit breaker panel is moved from the SAFE position, routing power to the INSIDE DOOR CONT SWITCH, located above the DOOR SAFETY SWITCH for SN 1000-1279, or located on the cockpit door edge behind the pilot seat for SN 1280 and subsequent. The control switch may then be selected to CLOSE, powering the Essential DC bus and auxiliary hydraulic system to close the door.

Once the door is closed, it must be latched and locked. From the outside of the airplane, the door is locked by pushing in the outer locking handle, then pushing in the inner latch to fair with the outside of the door. From inside the airplane, the door is latched and locked by pulling up on the red ball-shaped latch and then rotating the locking handle inboard and over-center.

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The red latch is then released.

The door is locked by the movement of the inner or outer locking handles that position six bayonet-type fittings from the door into openings in the door frame. The bayonet fittings lock the door in place and close microswitches within the door frame openings. The microswitches provide electrical inputs to the door warning system, door hydraulic system and to the door seal pressurization system. The microswitches are connected in series so that each switch must be in the correct position in order to generate the proper signal.

Automatic activation of the main entrance door emergency lighting is available on SN 1467 and subsequent through the use of a second set of emergency batteries. If the main entrance door is open and the EMERG POWER ARM switchlight (cockpit overhead panel) has been previously selected to ARM, activation of the emergency batteries will allow emergency batteries No. 3 and 4 to automatically power the interior emergency lighting and main entrance door emergency lighting.

B. Optional Cargo Door:

At customer option, a cargo door may be installed on the right side of the fuselage forward of the wing leading edge. The door is eighty and one-half (80 ½) inches high and eighty-one (81) inches wide and opens out and upward. The door is restricted to ground operation by the nutcracker (squat) switch system. Like the main entrance door, the cargo door is electrically controlled and hydraulically operated, has a pneumatically inflated seal, and is locked and latched mechanically. A depiction of the door is shown in Figure 4.

A door control panel is located just forward of the door on the inside of the airplane cabin. The control panel has four indicator / switchlights and an operating switch. Hydraulic power is furnished by the auxiliary hydraulic system that must be activated using the switch on the cockpit overhead panel. To open the door, the auxiliary hydraulic system must first be powered. The LOCK HDL REL switchlight is then pressed, and the UNLK legend appears in the switchlight. The UNLK legend indicates that the relay disabling the door locking handle has released, and the handle may be unlocked. The relay will only release the locking handle for ten (10) seconds during which time the handle may be moved to unlock the door. The door lock handle is mechanically connected to a vent door that opens when the lock handle is move to the unlock position. The vent door insures the release of cabin pressure prior to opening the cargo door. The position of the vent door, as viewed from outside the airplane, may be used as an indicator of the position of the door locking handle.

Once the door is unlocked, the door latching handle is moved to the open position. Moving the handle to the open position releases six (6) mechanical locks at the bottom of the door and opens the six microswitches in the door warning circuit. In the open position the handle opens relays enabling the auxiliary hydraulic system, reduced to 1400 psi (± 100) by the main entrance door reducer valve, to power the cargo door. The availability of hydraulic power is indicated by illumination of the DOOR HYD PWR indicator. The door switch, located on the lower section of the control panel, is selected to the OPEN position and the hydraulic actuator opens the cargo door. When the door is fully open, releasing the door

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switch de-energizes the hydraulic power relay, and trapped hydraulic pressure holds the door in the open position. Closing the door is the reverse of the opening sequence.

C. Baggage Compartment Door:

The airplane baggage compartment, located in the aft part of the pressurized section of the fuselage, is accessible in flight from an interior door in the passenger compartment, and on the ground through an exterior door fitted into the left side of the fuselage below the left engine pylon. See Figure 5. The exterior door opens inward and upward to provide access for loading and unloading baggage. Mechanically linked interior and exterior handles rotate to open the door. Like the main entrance door, the baggage compartment door is fitted with four bayonet-type plungers that lock the door and position microswitches to provide the circuitry for door warning and door seal inflation. The baggage door may be used as a supplementary emergency exit from the airplane since the baggage compartment is accessible from the cabin.

D. Emergency Overwing Exit Windows:

Two overwing emergency exits are installed on each side of the airplane in the passenger seating area. The four overwing exits are the primary escape exits since the position of the exits provides adequate ground or water clearance for exiting the airplane in the event of a forced landing or ditching. The overwing exits are operated by pulling outward on the marked exit handles on the inside of the windows, unlatching the windows from the window seals. The windows may then be removed into the interior of the airplane, freeing the emergency access. There is an emergency exterior handle for each overwing window exit that is accessed through a door beneath each window. Placards on the airplane exterior provide instructions for opening the panels and rotating the handle within to open the corresponding emergency window.

2. Door Seal System:

A. Pressurized Doors:

The main entrance door, baggage compartment door and optional cargo door are surrounded by pneumatic seals that inflate to maintain cabin pressurization in flight. The seals are manufactured from natural or synthetic rubber compounds reinforced with knitted elastic fabric and covered with neoprene. The door seals are connected to a dedicated pneumatic supply line plumbed into the bleed air manifold. A pressure regulator in the supply line maintains inflation at seventeen (17) to nineteen (19) psi and incorporates a safety relief valve to prevent over-inflation and blowouts of the seals. Check valves installed in the line maintain seal inflation in the event of loss of bleed air pressure, ensuring the integrity of cabin pressurization.

Door seals are activated when the doors are in the correct locked and latched position, signalled by the position of the bayonet fittings on the main entrance and baggage doors or locking and latching handles on the optional cargo door. The seals inflate as engine bleed air enters the manifold for cabin pressurization, pushing out against the frame of each door.

On airplanes SN 1000-1284 having ASC 364, and SN 1285 and

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subsequent, additional pneumatic supply lines, one from each engine, are installed to the door seal pressure regulator. The additional lines ensure a constant pressure and flow output from the door seal regulator.

B. Smoke Evacuation Valve:

On airplanes SN 1000-1155 having ASC 157, SN 1034 and 1156 and subsequent, a smoke evacuation valve is installed in the pneumatic line to the baggage door inflatable seal. See the illustration in Figure 6. The evacuation valve is located within a panel on top of the frame of the door opening from the passenger cabin into the baggage compartment. The valve has two positions: NORMAL OPS that selects normal operation of the baggage door seal, and EVAC SMOKE that closes the pneumatic line to the baggage door seal, deflating the seal and allowing any smoke accumulating in the aft section of the pressurized cabin to be drawn out of the airplane around the deflated baggage compartment door seal.

3. Unpressurized Section Doors:

A. Tail Compartment Door:

Access to the unpressurized compartment in the aft fuselage is provided by a door and a telescoping ladder attached to the inside of the door. See Figure 7. The tail compartment door is opened and closed from outside the airplane with a handle installed flush with the airplane surface, accessed by a push-to-release button on the handle. When the handle is released, it extends and can be rotated to retract the bayonet fittings that lock the door. The door opens downward and the attached ladder is manually extended to provide access to the compartment. A microswitch on the bayonet fitting recess is connected to the door warning system. The microswitch will also extinguish any tail compartment lights left on when the door is latched.

If for some reason the telescoping ladder has moved from the stowed position while the door is closed and interferes with opening the door, a small access panel on the aft part of the door may be removed and the ladder repositioned to operate the door.

B. Service Compartment Doors:

The doors of the airplane service panels have a striker plate that closes a microswitch within the panel. When the door to the panel is opened, the microswitch is opened, powering a light within the panel and sending an open signal to the door warning system.

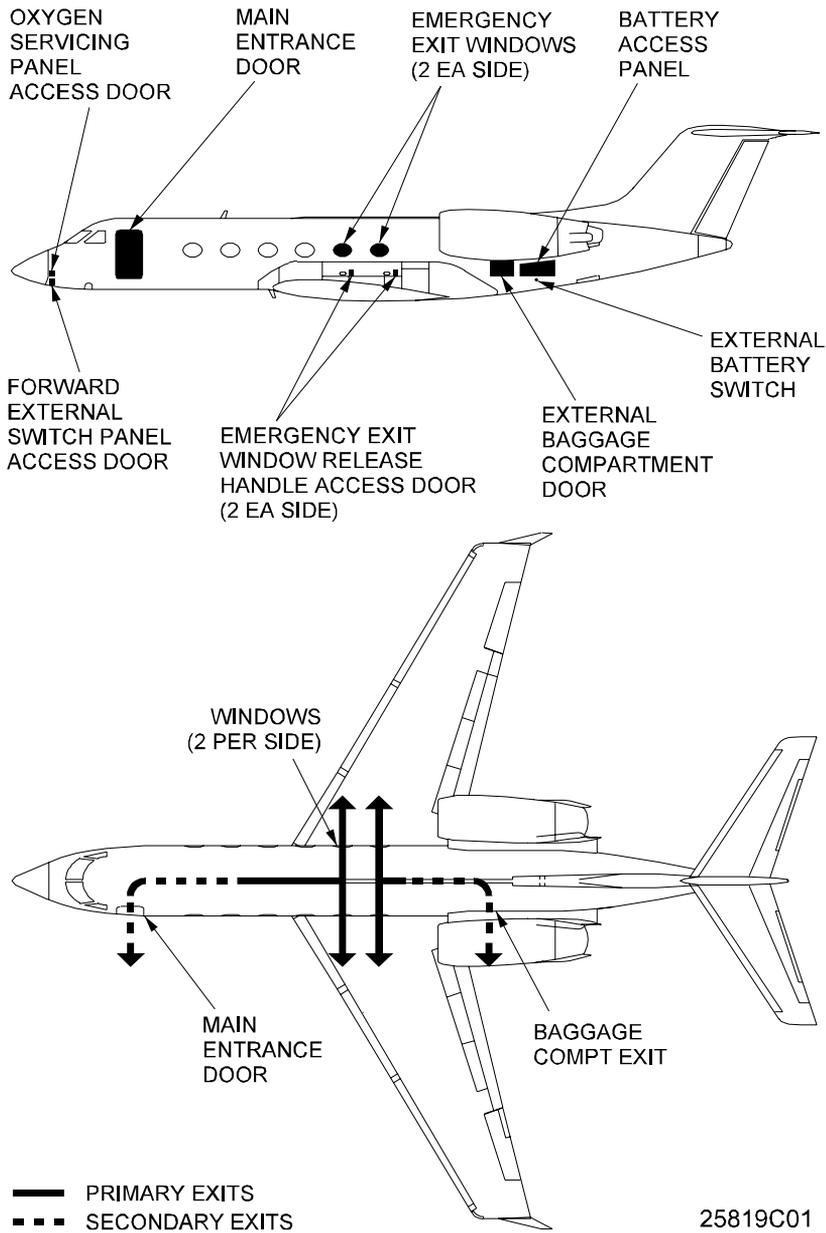
The following service panels are located on the exterior of the airplane. Not all airplanes have the provision for panel internal lighting or for door position monitoring with the door warning system.

- Lavatory service
- Water service
- Oxygen service
- Single-point refueling
- Forward external switch panel

A forward lavatory service panel is installed as standard equipment on SN 1439 and subsequent. SN 1439 through 1454 have provisions to enable door position monitoring, if desired by the operator. On SN 1455 and subsequent, door position monitoring is enabled as standard.

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Entrances, Exits and External Doors (Airlanes Not Having Cargo Door)
Figure 1

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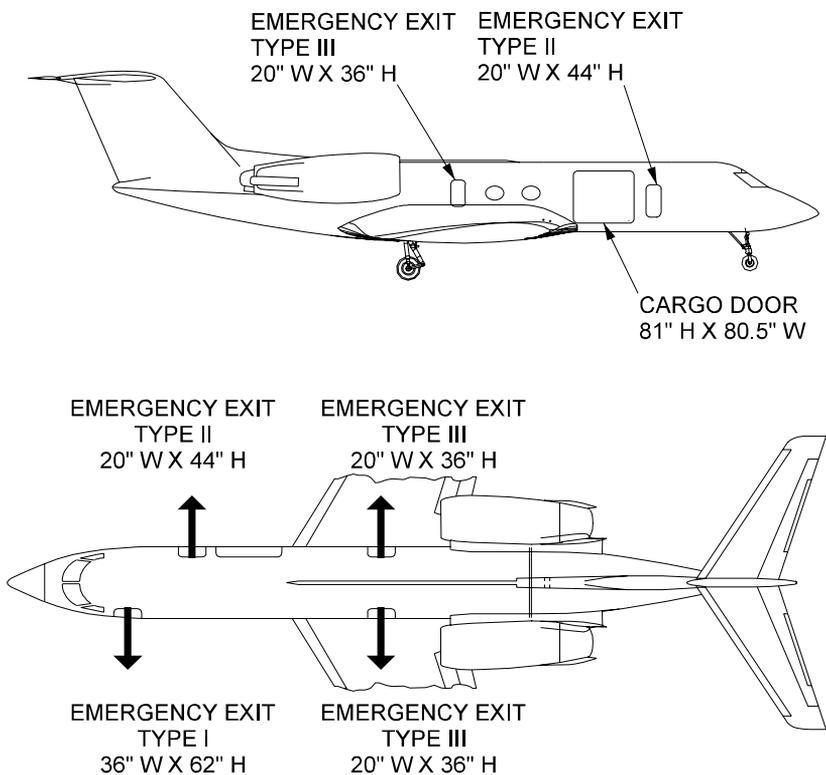
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NOTE: DEPICTS AIRCRAFT WITH ASC 213

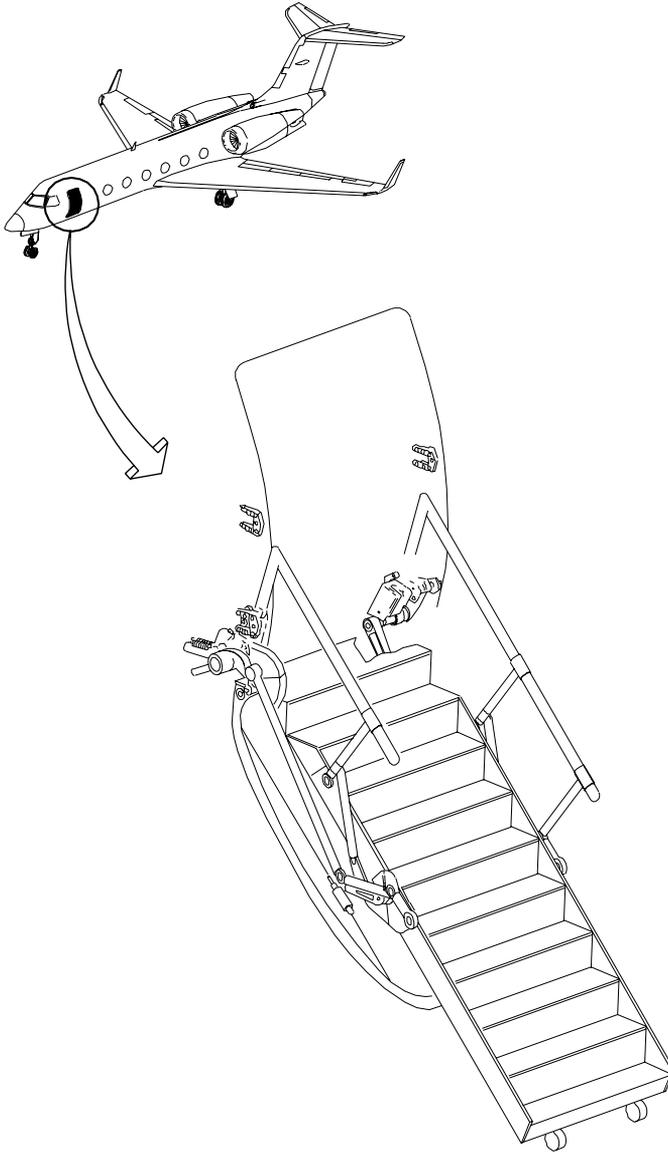


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Entrances, Exits and External Doors (Airplanes Having Cargo Door)
Figure 2

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Main Entrance Door Installation
Figure 3

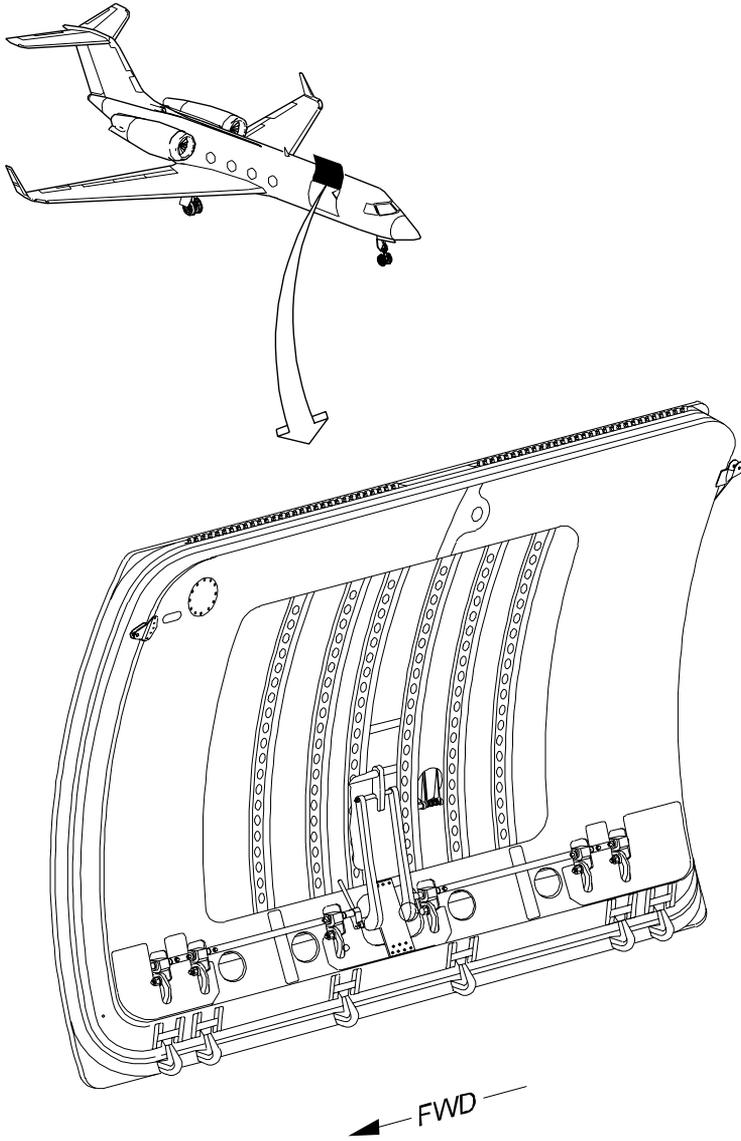
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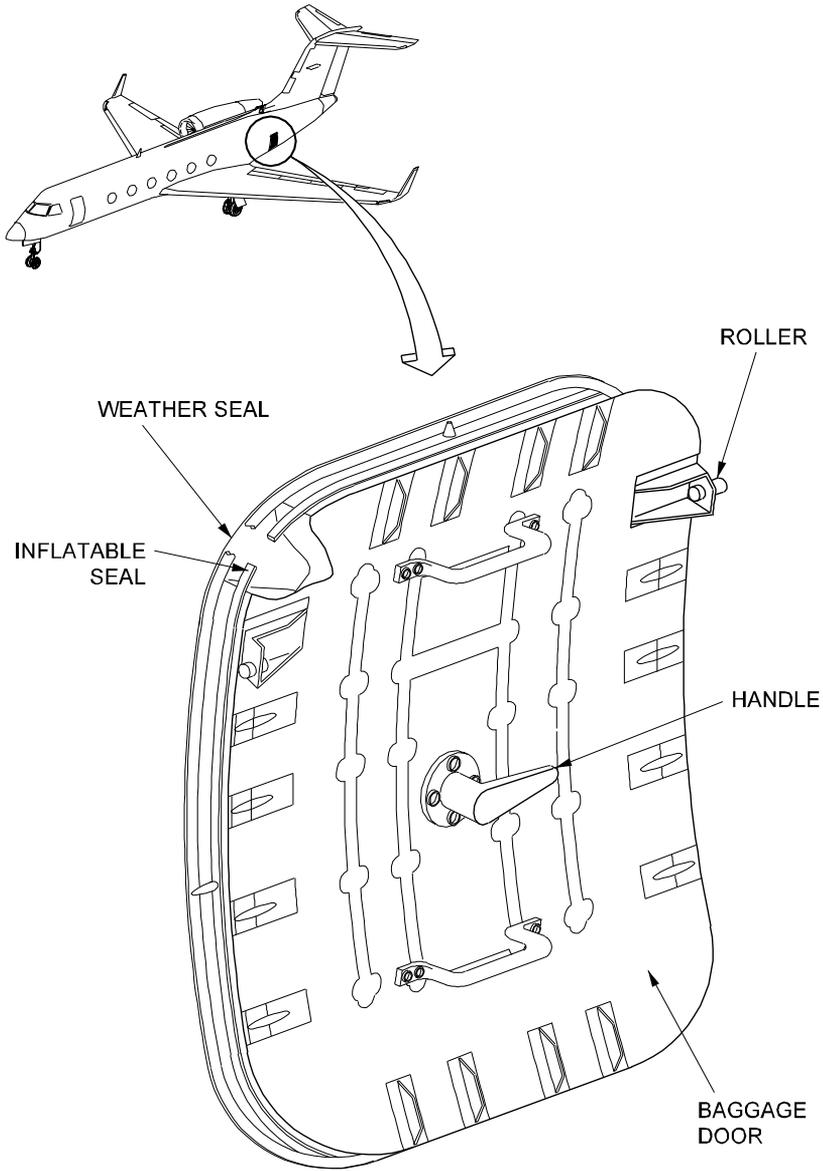
Cargo Door Installation
Figure 4

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Baggage Compartment Door Installation
Figure 5

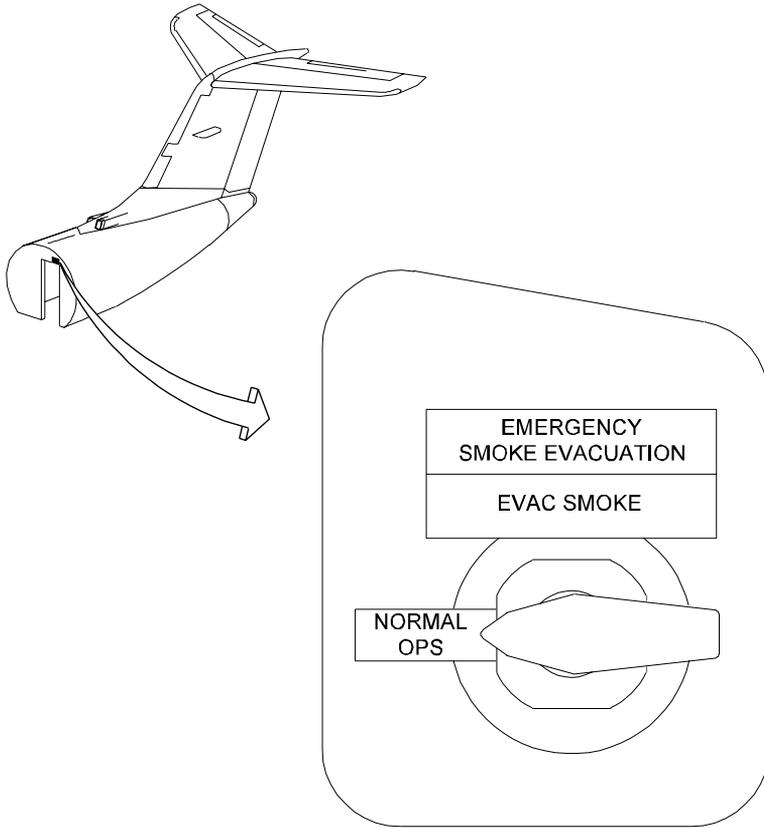
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EMERGENCY SMOKE EVACUATION

(SN 1000-1155 (excluding SN 1034) having
ASC 157; SN 1034; SN 1156 and subs)

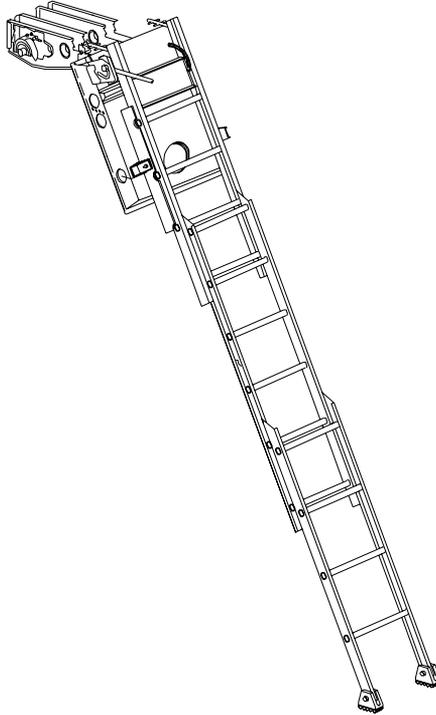
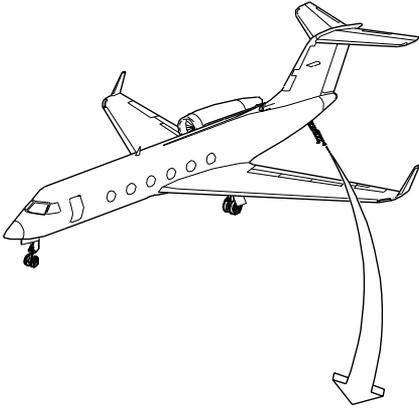
- **EVAC SMOKE:** Allows deflation of baggage compartment door seal.
- **NORMAL OPS:** Allows baggage compartment door seal to reinflate.

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Smoke Evacuation Valve
Figure 6

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Tail Compartment Door Installation
Figure 7

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2A-52-30: Door Controls and Indications:

1. Pressurized Section Door Controls:

A. Main Entrance Door:

The main entrance door is locked by bayonet fittings positioned by a locking handle on the inside of the door or by an outside locking handle. Both the inside and outside handles have secondary latch release handles that secure the locking handles in the locked position.

The main entrance door is normally opened by manually unlocking the bayonet fittings and pushing (from inside) or pulling (from outside) the door over center and letting the door and attached airstair open in a controlled free fall using the weight of the door assembly. See Figure 9 and Figure 10. The opening action of the door is damped by the controlled release of trapped hydraulic fluid. Neither electrical nor hydraulic power are required to open the main entrance door. Normal procedures for opening the main entrance door can be found in Section 09-01-40, Opening and Closing Airplane Doors.

The main entrance door is normally closed using electrical switches located inside an exterior panel or by switches in the cockpit (and on the cockpit door frame for some airplanes) shown in Figure 8 and Figure 10. These switches enable the door close circuitry and control operation of the Auxiliary Hydraulic (AUX) pump during closing. Normal procedures for closing the main entrance door can be found in Section 09-01-40, Opening and Closing Airplane Doors.

If necessary, the main entrance door may be closed or opened manually using alternate procedures. Whenever alternate procedures are used to open or close the main entrance door, the flight crew should ensure the door is never allowed to free fall. If there is no controlled release of hydraulic fluid, damping will not be available and the door could fall with its full weight, resulting in serious injury to personnel and heavy damage to the door and airplane. Alternate procedures for opening the main entrance door, found in Section 09-03-20, Manually Opening and Closing Main Entrance Door, must be carefully followed to ensure maximum safety.

B. Baggage Compartment Door:

The baggage compartment door is opened manually with either the interior or exterior door handle, positioning the integrated bayonet fittings that lock the door. Procedures for opening and closing the baggage compartment door can be found in Section 09-01-40, Opening and Closing Airplane Doors.

C. Optional Cargo Door:

The cargo door, if installed, is controlled with switches on a door control panel, shown in Figure 11. The panel has four switchlights and a three-position control switch.

2. Unpressurized Section Door Controls:

A. Tail Compartment Door:

The tail compartment door is manually opened from the outside with a faired handle, and the attached telescoping stair is extended by hand. Procedures for opening and closing the tail compartment door can be found in Section 09-01-40, Opening and Closing Airplane Doors.

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B. Service Compartment Doors:

Service compartment doors are opened by pressing latch release buttons integrated into the spring-held latches.

3. Door Warning System:

The door warning system monitors the position of the main entrance door, baggage compartment door, cargo door (if installed) and the tail compartment and service doors. A 28V DC circuit will illuminate EICAS, SWLP, or instrument panel light capsule warnings if microswitches are not closed by the locking action of doors. The microswitches are located on:

- The forward upper, top and lower aft bayonet fitting receptacles in the frame of the main entrance door
- The main entrance door latching handle
- The aft bayonet fitting receptacle of the baggage door
- If installed, on the six hook latches of the cargo door and on the cargo door locking handle
- On plunger fittings on the frame of the aft compartment door and service compartment doors

4. CAS Messages:

A. Warning (Red) CAS Messages:

CAS Message	Cause or Meaning
DOOR MAIN	Main entrance door open or unlocked
DOOR BAGGAGE (1)	Baggage door open or unlocked

NOTE(S):

(1) Amber caution message on SN 1000-1389 having ASC 415, SN 1390 & subs.

B. Caution (Amber) CAS Messages:

CAS Message	Cause or Meaning
BAGGAGE DOOR (1)	Baggage door is open or unlocked

NOTE(S):

(1) SN 1000-1389 having ASC 415, SN 1390 & subs.

C. Blue (Advisory) CAS Messages:

CAS Message	Cause or Meaning
SERVICE DOORS	One or more of the following doors is open: <ul style="list-style-type: none"> • Tail compartment door Service compartment doors (applicability varies): <ul style="list-style-type: none"> • Refueling panel • Oxygen service panel • Water service panel • Aft lavatory service panel • Forward external switch panel • Forward lavatory service panel (SN 1455 & subs)

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D. Standby Warning Lights Panel (SWLP) Annunciations (SPZ-8000 Equipped Airplanes):

Annunciation	Cause or Meaning
CABIN DOORS	Main entrance and/or baggage door open or unlocked

E. Instrument Panel Annunciations:

For airplanes equipped with the optional cargo door, an indicator light capsule is installed on the pilot and copilot instrument panels that illuminates with the text CARGO DOOR whenever the door is open or unlocked. See Figure 12.

5. Circuit Breakers (CBs):

Circuit Breaker Name	CB Panel	Location	Power Source
DOOR CONT / WARN	CPO	B-8	ESS 28V DC
CARGO DOOR SOL	CPO	A-14	ESS 28V DC

6. Limitations:

A. Flight Manual Limitations:

There are no limitations for the door controls and indications system at the time of this revision.

B. System Notes:

- (1) Main Entrance Door:
 - (a) If the main entrance door was manually closed, there will be no restricted damping to oppose the weight of the door during opening. Serious injury to personnel or damage to door and airplane could result if door is allowed to free-fall to the open position.
 - (b) Never stand underneath the main entrance door when opening the door.
 - (c) Do not stand or walk on the main entrance door until it is fully extended, locked and in contact with the ramp surface.
 - (d) To prevent damage to the main entrance door sill area, ensure the bayonet fittings are fully retracted before attempting to close the door.
- (2) Optional Cargo Door:
 - (a) If the optional cargo door is installed, it should not be operated when winds are in excess of forty (40) knots, or if the door is open and mechanically braced, when winds are in excess of fifty (50) knots.
- (3) Baggage Compartment Door:
 - (a) To prevent damage to the baggage compartment door sill area, ensure door handle is rotated to unlock before attempting to close door.
- (4) Tail Compartment Door:

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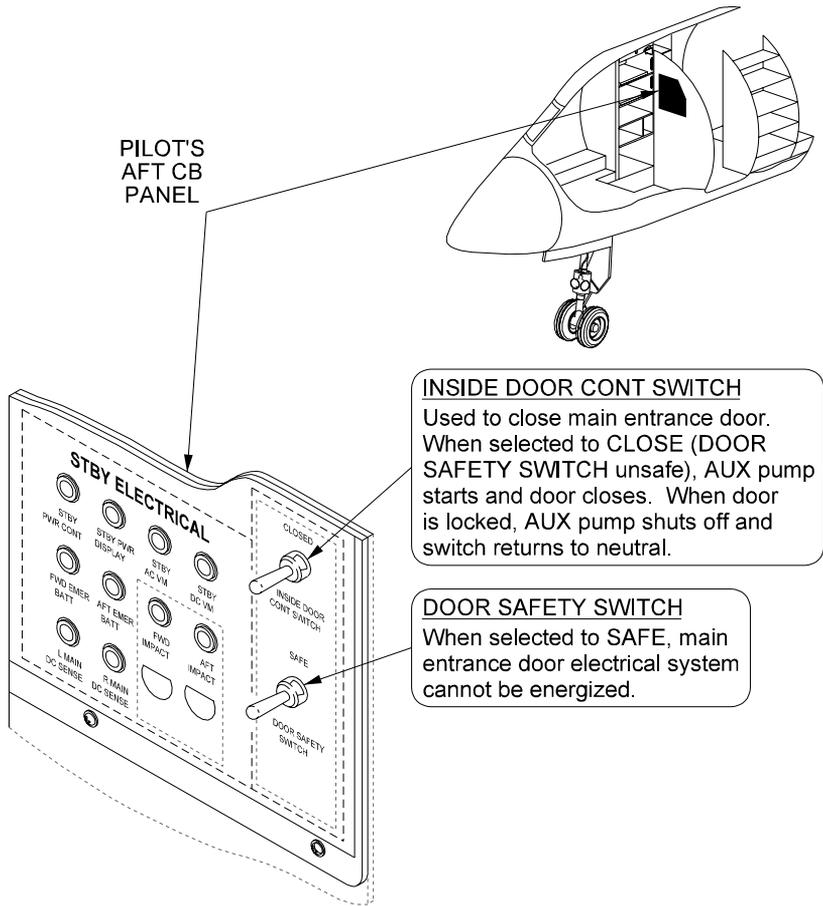
- (a) During flight, objects may become dislodged and come to rest on the tail compartment door. When opening the tail compartment door, be alert for objects that may be resting on the door. Always ensure the tail compartment ladder has not become disconnected from door.

If the tail compartment ladder has become disconnected from door, the door may be prevented from lowering once unlocked. If this happens, removing an access panel on the door exterior will allow the flight crew to reach inside the door and position the ladder so that the door may be lowered.

- (b) Prior to closing the tail compartment door, ensure the tail compartment ladder is properly secured to the door.

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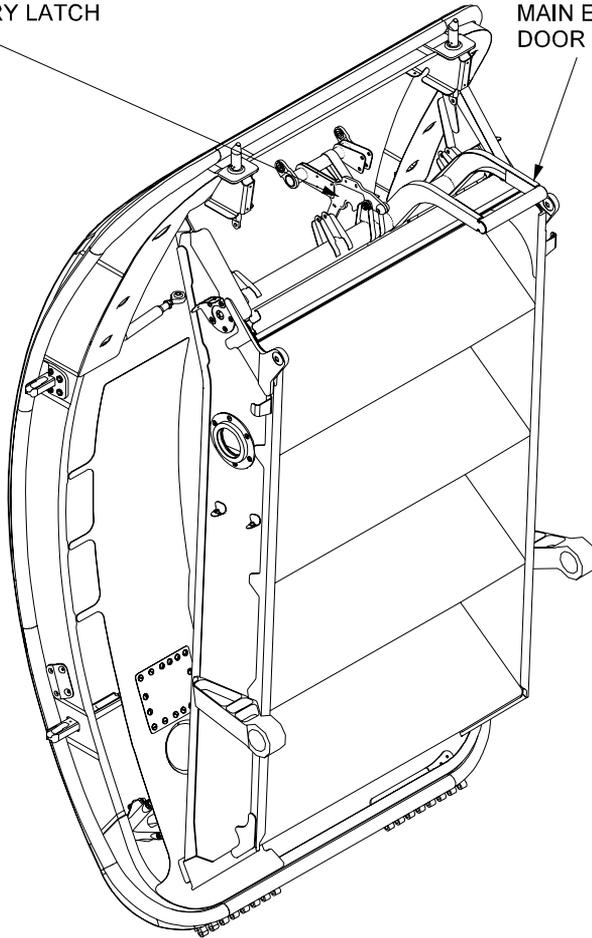
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Interior Main Entrance Door Control Switches
Figure 8

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SECONDARY LATCH
RELEASE

MAIN ENTRANCE
DOOR HANDLE



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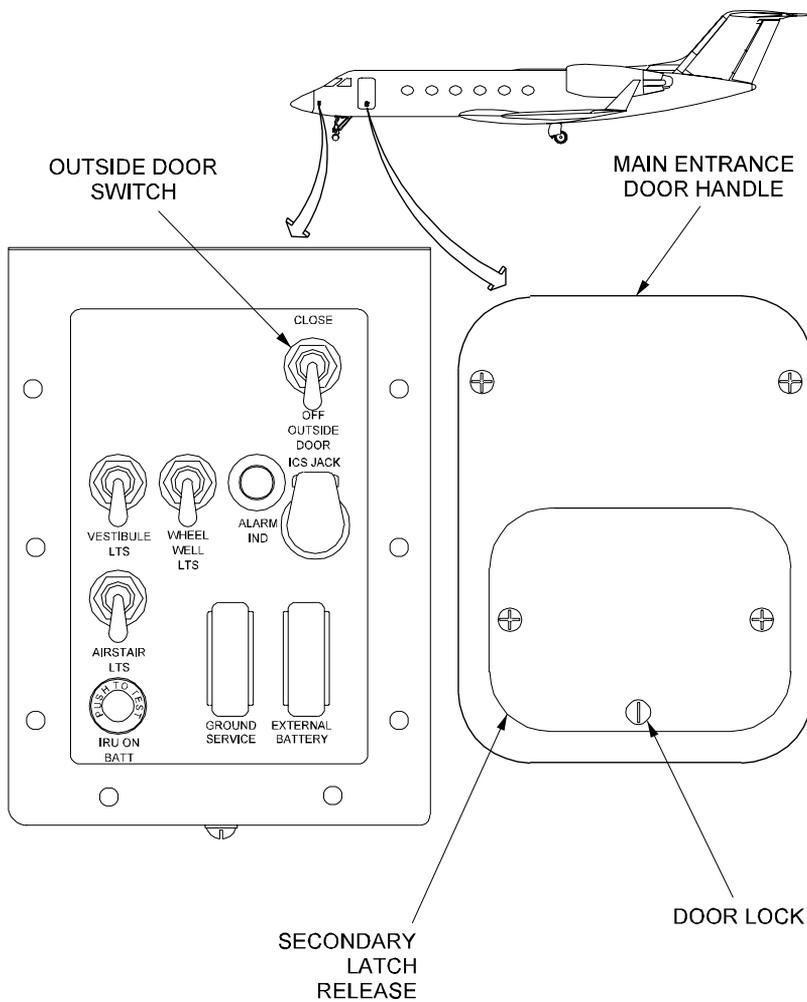
Interior Main Entrance Door Handles
Figure 9

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Exterior Main Entrance Door Handle and Control Switches
Figure 10

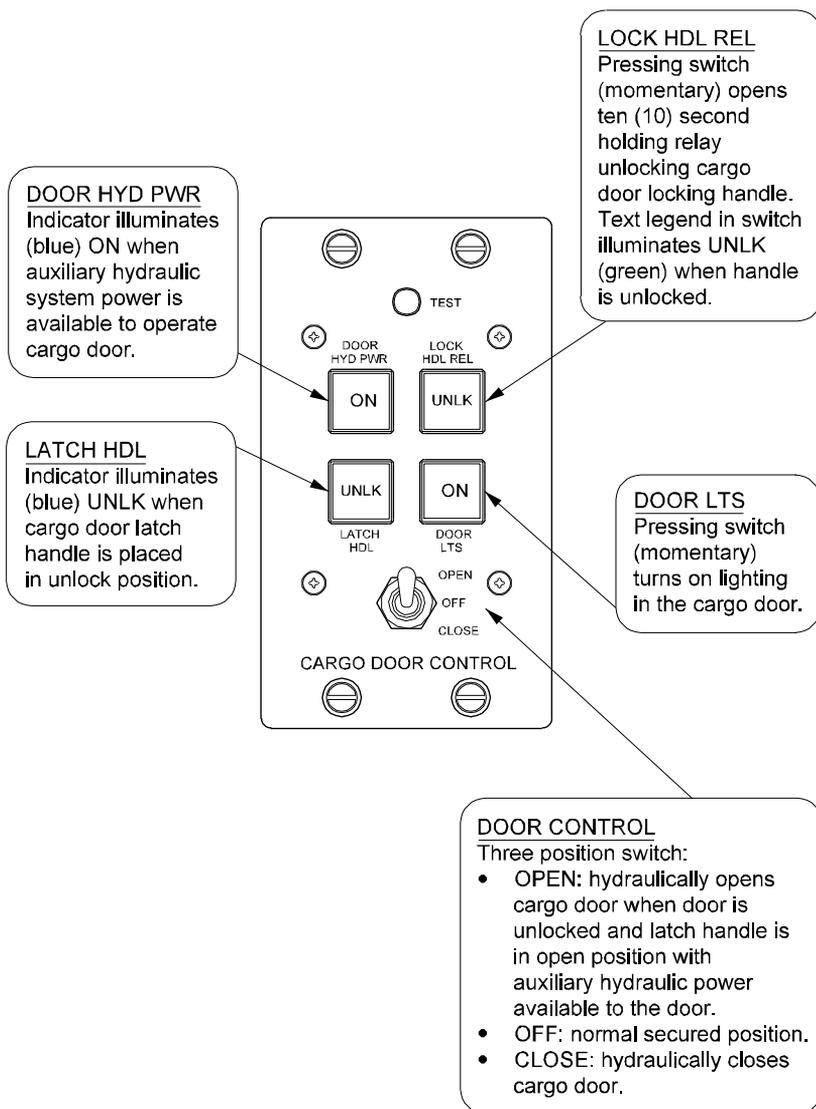
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Cargo Door Control Panel
Figure 11

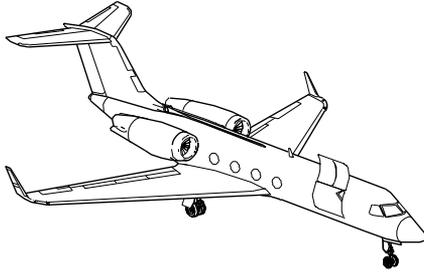
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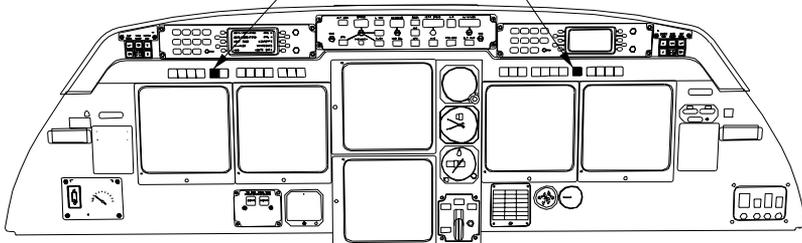
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CARGO DOOR
Warning lights illuminate (red)
when cargo door is open or
unlocked.



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Cargo Door Warning Lights on Instrument Panels
Figure 12

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