



TECHSAVIATION

Training Center

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Flight Crew Oxygen

The 787 is equipped with two gaseous oxygen bottles for the flight crew. The oxygen bottles are in the right tunnel area of the forward Electronic Equipment (EE) bay.

Earlier aircraft must have the bottles removed for servicing. Later aircraft have an optional remote fill panel installed in the forward EE bay.

Description

The bottle is made of graphite composite material. It weighs 19 lb (9 kg) empty and 29 lb (13 kg) when fully serviced.

An oxygen bottle has these components:

- Shutoff valve
- Pressure regulator
- Frangible disc
- Pressure gauge
- Pressure transducer
- Fill fitting.

The bottle has a capacity of 115 cubic feet (3,030 liters). The normal full pressure of the bottle is 1,850 psi (1,850 kPag) at 70°F (21°C).

The pressure appears on the bottle direct reading pressure gauge. The bottle pressure also appears on the EICAS status page of the Head- Down Display (HDD). A low pressure caution message can appear on EICAS.

The manifold has a pressure sensor.

The pressure regulator decreases the bottle pressure to a usable 60 to 85 psi.

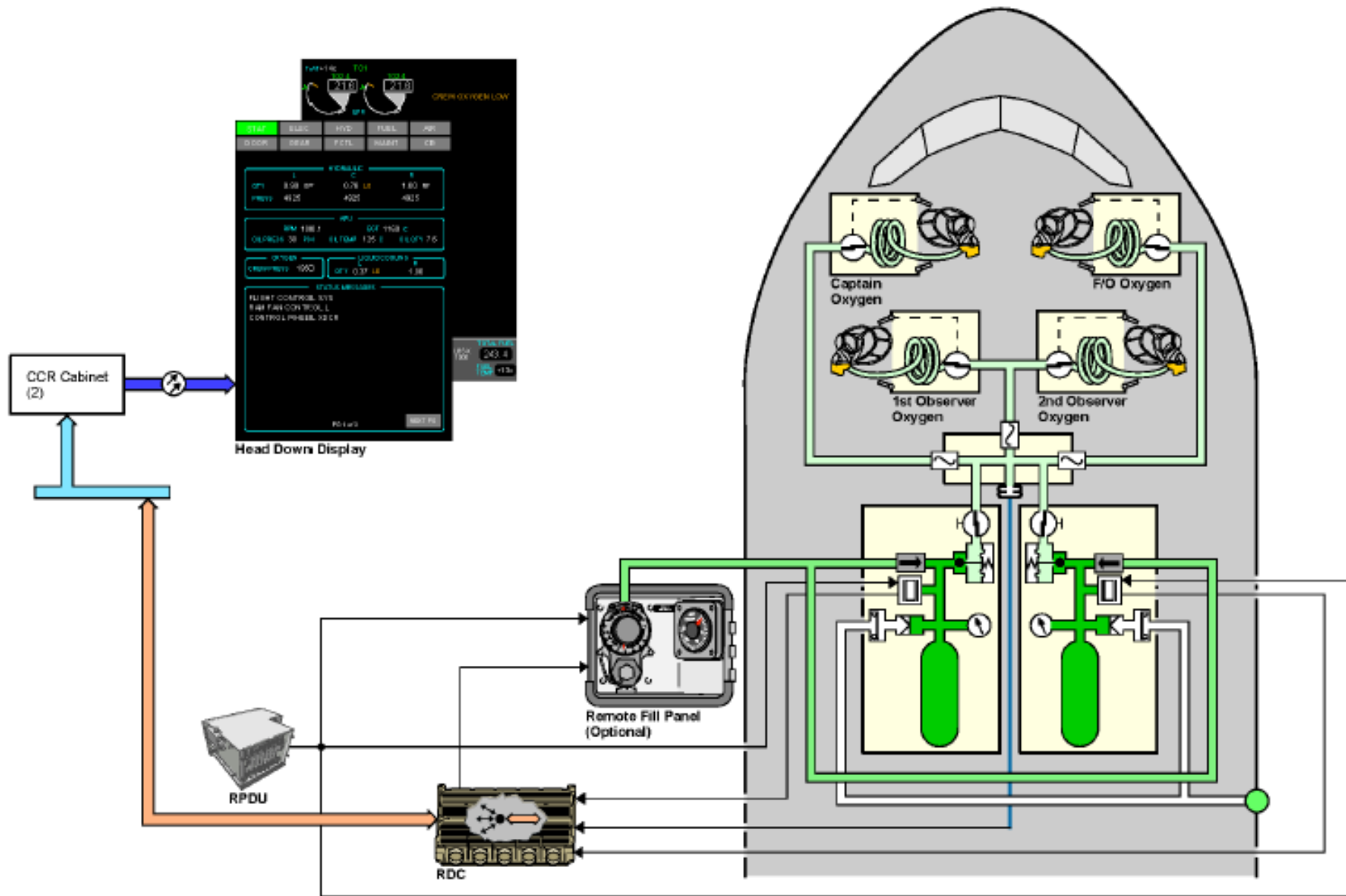
The frangible disc for a bottle ruptures at 2,700 to 3,000 psi, at a temperature of 70°F (21°C). The oxygen leaves the oxygen bottle through a vent manifold. The oxygen pressure forces a green disc out of the fuselage, on the right side of the nose.

The oxygen bottle connects to a manifold with three circuits. The three circuits connect to these masks:

- Captain
- First officer
- First and second observer.

Three volumetric fuses are in the manifold. The fuses prevent a complete loss of oxygen if part of the manifold leaks.

Each oxygen mask stows in a box. When the mask is stowed, and the box door is closed, an internal valve shuts off the flow of oxygen.



Flight Crew Oxygen Masks

There are four masks for these flight crew members:

- Captain
- First officer
- First observer
- Second observer.

The masks stow in boxes next to each of the four seats. Doors on the box keep the mask stowed.

Description

The masks are the full-face type with smoke goggles. The goggles can be removed from the mask when not required.

The masks have a harness that inflates with oxygen pressure. The inflated harness lets the crew member put the mask over their face quickly. The crew member pushes donning tabs on the front of the mask to inflate the harness.

When the mask is removed from the storage box, a microphone inside the mask automatically connects to the flight interphone.

The mask has two controls. The first control is a lever that sets the mask for either 100 percent oxygen, or oxygen diluted with ambient air. The second control is a knob that can turn or can be pushed. This knob controls the positive flow emergency setting when turned. The knob tests the flow of oxygen through the mask when pushed. This knob is also pushed when the TEST AND RESET lever on the stowage box door is pushed to TEST with the mask stowed.

A blinker device shows a yellow cross with the flow of oxygen present. The cross no longer appears when the flow stops.

The mask has an automatic pressure breathing mode. This mode operates when cabin altitude is between 34,000 and 45,000 feet.

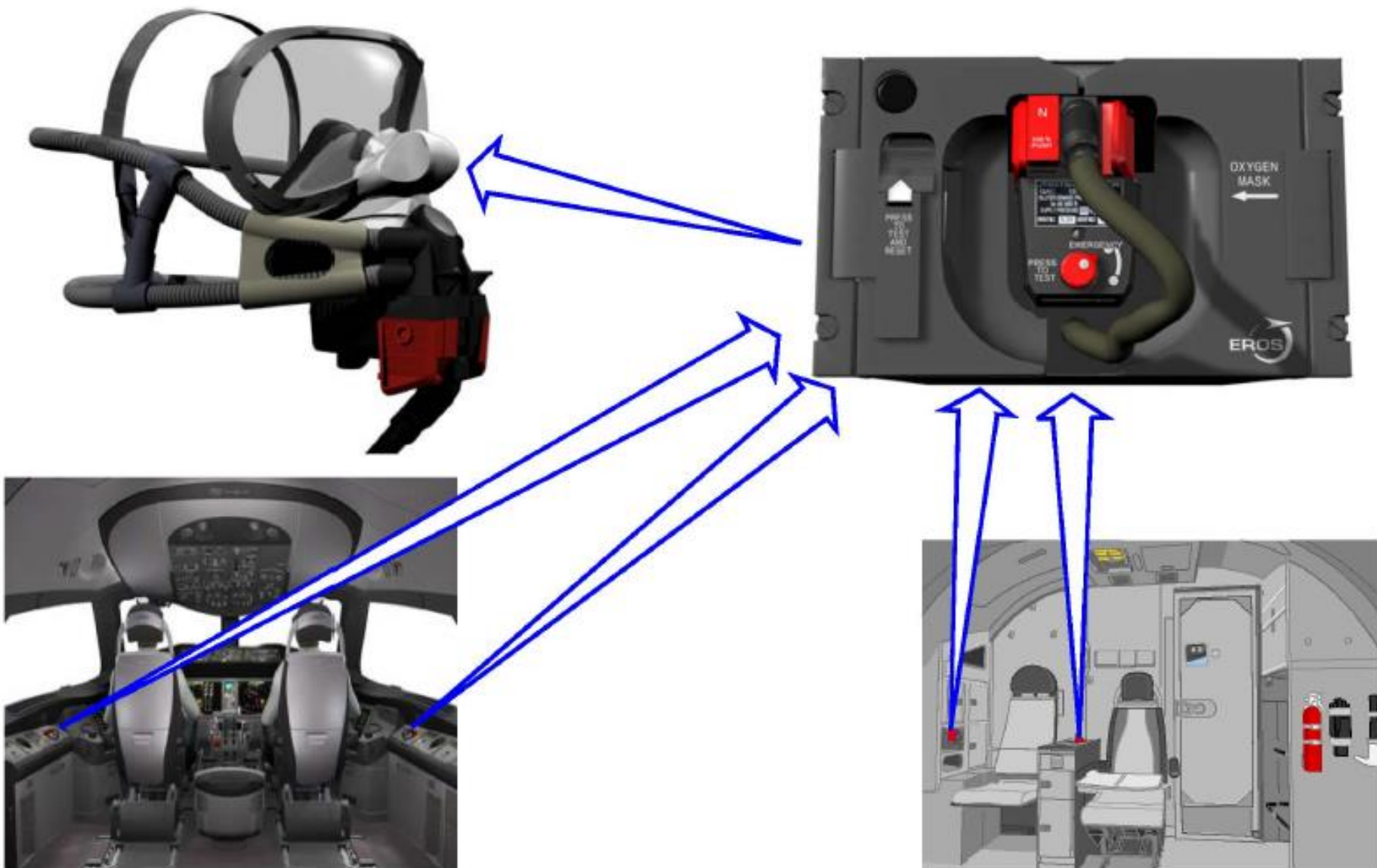
In this mode, positive oxygen pressure in the mask helps to prevent a hypoxia condition.

Operation

Push the lever on the left door of the stowage box. This tests the flow of oxygen. You can hear the oxygen flow, and see a yellow cross in the blinker.

To use the mask, pull it out of the stowage box. The Shutoff Valve (SOV) in the box automatically opens and a flag appears. Push the donning tab to inflate the harness.

In diluted or 100 percent, inhale to start the flow of oxygen. Emergency is a constant flow. Stow the mask, close the doors, and push RESET to close the SOV. The OXY ON flag no longer appears.



Cabin Crew and Passenger Oxygen

The cabin crew and passenger oxygen system uses gaseous bottles. The bottles are in these service units:

- Passenger Service Units (PSU)
- Attendant panel
- Lavatory units
- The optional Overhead Flight Crew Rest (OFCR) and Overhead Flight Attendant Rest (OFAR) compartments.

Description

The bottles are of three different sizes. The number of masks determines the size of the bottle. The minimum number of masks is one, and the maximum number is six. The bottle is made of aluminum and the pressure of a fully charged bottle is 3,000 psi. Each service unit has a controller. The controller controls the opening of the door, bottle, and flow of oxygen to the masks. Each controller also tests its components during ground tests.

Each oxygen bottle has these components:

- Pyrotechnic disc cutter
- Low-pressure manifold
- Frangible burst disc
- Constant output pressure regulator set to 16 psi.

The masks are the oral nasal type, without a reservoir bag. The masks dilute oxygen with cabin air.

Operation

Operation to open the doors for the masks comes from a hosted application in the Common Core System (CCS). The CCS automatically opens the service unit doors when cabin altitude is more than 15,000 feet. The CCS also opens the doors when pilots select the passenger oxygen switch on the P5 panel to ON. An amber ON indication appears on the switch when the oxygen system is on.

Each controller has an interface with these components:

- Individual mask control valves
- Breath sensors
- Pyrotechnic disc cutter.

To start oxygen flow, put a mask on and inhale. A breath sensor sends a signal to the controller. The controller activates the disc cutter to break the frangible disc. Oxygen goes through the regulator to the low pressure manifold. The controller gets cabin altitude data from the CCS. The controllers use the data to calculate how much oxygen to pulse to the masks with each inhaled breath. The amount of oxygen is determined by blood saturation requirements between 10,000 and 43,100 feet.

