02-35 ATA 35 – OXYGEN

02-35-00 TABLE OF CONTENTS

02-35-05 GENERAL
   Introduction
   Sources
   Equipment location

02-35-10 DESCRIPTION
   Crew member and passenger oxygen systems
   Crew member quick-donning oxygen mask regulator
   Portable oxygen bottle (option)
   Distribution

02-35-15 CONTROL AND INDICATION
   Control
   Indication

02-35-20 SYSTEM PROTECTION
   Introduction
   Circuit breakers

02-35-25 NORMAL OPERATION
   Introduction
   IN-FLIGHT operation
   Crew member quick-donning oxygen mask regulator operation
   Smoke goggles operation
   Protective breathing equipment operation
   Passenger oxygen mask operation
   Portable oxygen bottle operation (optional)

02-35-30 ABNORMAL OPERATION
   Introduction
   Airplane flying with override operation of passenger masks
   CAS message
INTRODUCTION

The airplane is equipped with an oxygen system which supplies crew members and passengers in case of cabin depressurization or smoke in the cabin.

The system uses oxygen gas contained in a high-pressure cylinder and provides crew members and passengers with low-pressure oxygen.
ATA 35 – OXYGEN

GENERAL

FIGURE 02-35-05-00 FLIGHT DECK OVERVIEW

Circuit breaker overhead panel

Oxygen overhead panel rotating selector

ECS and STAT synoptics

Oxygen mask box

Oxygen mask box

DASSAULT AVIATION Proprietary Data
## SOURCES

Oxygen system sources consist of a fixed single high-pressure oxygen cylinder, a protective breathing equipment (smoke hood) and an optional portable oxygen bottle.

<table>
<thead>
<tr>
<th>FIXED</th>
<th>PROTECTIVE BREATHING EQUIPMENT</th>
</tr>
</thead>
</table>
| - Single high-pressure oxygen cylinder  
  - Capacity: 2,200 l (77.7 cu.ft) or 3,300 l (115 cu.ft) optional, operating rated pressure 1,850 psi (128 bar) at 21°C (69.8°F) reduced to 70 psi (4.8 bar) for distribution | - Protective breathing equipment fitted with an oxygen generator  
  - Capacity: 90 l (3.2 cu.ft)  
  - Oxygen supply time: 15 min regardless of work load |

### PORTABLE OXYGEN BOTTLE (OPTIONAL)

- Portable oxygen bottle fitted with two flow outlets  
  - Capacity: 311 l (11 cu.ft)
EQUIPMENT LOCATION

FIGURE 02-35-05-01 CREW OXYGEN EQUIPMENT LOCATION
Passenger oxygen masks are stored in the mask boxes located behind the decor strips above each passenger seat and in the toilet compartment. Passenger oxygen masks are distributed according to airplane layout.
CREW MEMBER AND PASSENGER OXYGEN SYSTEMS

The oxygen supply system consists of a high-pressure cylinder fitted with a pressure reducing valve, a shut-off valve, a filler connection and a high-pressure gauge.

The access to the cylinder is through a small maintenance access hatch located on the RH side of the passenger door sill. Access to the pressure reducing valve is possible in flight through a quick access door. Located on the forward face of the oxygen cylinder compartment, the pressure gauge features a dial with dual pressure marking graduation scale (psi and bar).

Oxygen cylinder refilling is performed from the outside of the airplane.

For more information, see GROUND SERVICING manual (DGT681).

Oxygen cylinder ensures oxygen supply to the crew members and the passengers.

The oxygen can be used down to a minimum internal cylinder pressure of 200 psi (13.8 bar).

The crew members oxygen system supplies diluted or pure oxygen to the pilot and copilot.

An electro-pneumatic oxygen controller supplies oxygen to passengers when necessary or for first aid use.
CREW MEMBER QUICK-DONNING OXYGEN MASK REGULATOR

Each crew member has a quick-donning mask equipped with a built-in regulator and a microphone.

The top of the mask features a device which supplies overpressure into the smoke goggles.

Crew members oxygen masks, comprising integral smoke goggles, are available as an option.

The crew member masks are classified as quick-donning masks because they can be donned with one hand within five seconds.

Oxygen is supplied at a pressure of 70 psi (4.8 bar) and the mask incorporates a flow regulator to supply either diluted oxygen (air-oxygen mixture function of cabin altitude) or 100% pure oxygen with or without overpressure (manually controlled or function of cabin altitude).

Each quick-donning mask is composed of:
- an oxygen mask featuring a microphone and a vent valve control allowing overpressure in the smoke goggles for protection against smoke and toxic gases,
- a regulator,
- an inflatable harness,
- an oxygen hose with radio line,
- a flow indicator indicating whether the oxygen flow rate is effective when the mask is in use.

The regulator is fitted with:
- a tumbler switch with two positions N / 100%,
- a PRESS TO TEST control knob with two positions:
  - EMERGENCY (flight with smoke),
  - TEST (mask operation test),
- two red levers, one of which is used for inflating the harness,
- a NORM - COMF toggle switch which is used to adjust the inflatable harness.
FIGURE 02-35-10-00 QUICK-DONNING OXYGEN MASK
SMOKE GOGGLES

These non-flammable smoke goggles are designed to protect the pilot against smoke and toxic gases on the flight deck. Glasses can be worn easily under the goggles.

FIGURE 02-35-10-01 SMOKE GOGGLES

FIGURE 02-35-10-02 SMOKE GOGGLES AND OXYGEN MASK
QUICK-DONNING OXYGEN MASK REGULATOR STOWAGE BOX

An oxygen mask box is installed on both the LH pilot and the RH pilot consoles. When stowed, the center part of the mask regulator protrudes, enabling the pilot to quick-don the mask. The lower portion of the box is fitted with receptacles for the oxygen hose and the microphone jack.

A third crew member mask (passenger type) is stowed in a box in the cockpit ceiling. It can optionally be replaced by a third crew member quick-donning mask (pilot type).

FIGURE 02-35-10-03 QUICK-DONNING OXYGEN MASK STOWAGE BOX
PROTECTIVE BREATHING EQUIPMENT

A protective breathing equipment fitted with an oxygen generator is provided. The protective breathing equipment is located in the LH cabinet.

It allows inspection of the cabin or the baggage compartment in case of fire.

This protective breathing equipment is composed of:
- a hood, airtight at the neck. It can be used by persons wearing glasses or having a beard or long hair,
- a solid state oxygen generator fitted with a pressure reducing valve,
- a chemical scrubber (CO2 and water vapor) fitted with a filter,
- a venturi pumping device ensuring air re-circulation.

It ensures 15 minutes of oxygen.

FIGURE 02-35-10-04 PROTECTIVE BREATHING EQUIPMENT
PASSENGERS OXYGEN MASKS

The system serves up to 21 stations and includes two first-aid masks, dual masks in the toilet, a mask above each passenger seat, a mask for the third crew member and two additional masks.

A **PAX ON** message, displayed in the ECS synoptic, appears as soon as oxygen pressure is detected in the passenger system.

The signal-triggered passenger oxygen system is used to activate **luminous signs**.

The passenger mask consists of a nosepiece and a mouthpiece incorporating a breath-in / breath-out valve and an additional air valve. Oxygen is supplied through a one-liter economizer bag. The constant flow rate of the mask is regulated by a nozzle integral with the mask box valve.

The mask fall-down and oxygen supply is ensured by the electro-pneumatic oxygen controller.

After the mask is deployed, it is held by a cord secured to a pin that keeps the oxygen valve closed. Pulling on the mask opens the valve to provide oxygen flow.

![PASSENGER OXYGEN MASKS](image)

**FIGURE 02-35-10-05 PASSENGER OXYGEN MASKS**
FIRST AID MASK (OPTION)

The two first-aid masks are similar to the passenger masks. They are adjusted at the mask
connection for flow rates of 2 to 4 liters per minute. These masks are to be plugged into the
special sockets in the roof of the cabin and are used to assist passengers requiring oxygen
for medical reasons.

If first-aid mask is to be used, proceed as follows:
- plug in the first-aid mask(s) in the cabin socket,
- select FIRST AID position with the rotating selector on the overhead panel,
- use oxygen as necessary.

When first-aid mask is no more needed:
- select NORMAL position with the rotating selector on the overhead panel,
- unplug the mask(s).

ELECTRO-PNEUMATIC OXYGEN CONTROLLER

The main function of the controller is to supply oxygen to passengers and third crew
member (except if optional third crew member quick-donning oxygen mask is installed) in
case of cabin depressurization or smoke.

The electro-pneumatic oxygen controller is located near the oxygen cylinder in order to
reduce the length of the capillary line and to allow test port connection to an altitude test
bench.

It provides four modes:
- CLOSED,
- NORMAL,
- FIRST AID,
- O’RIDE.

CLOSED mode

This mode allows to close the passenger oxygen system supply.

NORMAL mode

In NORMAL mode, passenger masks automatically drop from the ceiling in case of
depressurization. The cabin altitude threshold for the masks to fall down is 14,500 ft +/-
500 ft due to high altitude landing and take-off capability up to 14,000 ft.

Rated opening pressure of the mask door latch is 27 to 55 psi (1.86 to 3.80 bar).
Automatic cover removal allows the mask to drop out.

The oxygen flow at the outlet of each passenger mask is regulated according to cabin
altitude. Operating pressure is 5 ± 1 psi (0.34 ± 0.068 bar) between 8,000 ft and 18,500
ft, increasing linearly to 43.5 ± 4.5 psi (3 ± 0.31 bar) at 40,000 ft. Oxygen is closed below
8,000 ft.
FIRST AID mode

In FIRST AID mode, operating pressure is $5 \pm 1$ psi ($0.34 \pm 0.068$ bar) at 8,000 ft increasing to $43.5 \pm 4.5$ psi ($3 \pm 0.31$ bar) at 40,000 ft.

Automatic fall-down of the masks remains active in case of depressurization.

O'RIDE mode

In O'RIDE mode, operating pressure is 70 psi (4.8 bar) whatever the altitude is. If O'RIDE mode is used, it may be necessary to select NORMAL or FIRST AID mode again, or to check accurately the oxygen consumption at high operating pressure.

If oxygen is needed below 14,500 ft with low pressure, the FIRST AID position must be selected.
PORTABLE OXYGEN BOTTLE (OPTION)

The portable oxygen unit is made of a metallic cylinder containing pressurized oxygen. It is located in the LH crew cabinet.

The portable oxygen bottle provides a regulated 70 psi (4.8 bar) outlet oxygen pressure. The contents of the oxygen cylinders for portable units must be checked before flight. It provides a reserve ensuring the user a 15-minute autonomy in compliance with regulations.

The portable oxygen bottle is equipped with two masks, which can be used simultaneously.

The upper part contains the following:

- a pressure gauge,
- a carrying strap,
- two continuous flow bayonet couplings with caps,
- a low pressure relief valve,
- a valve.

![Carrying strap](attachment:image.png)

**FIGURE 02-35-10-06 PORTABLE OXYGEN BOTTLE**

![Valve and Couplings](attachment:image.png)

**FIGURE 02-35-10-07 PORTABLE OXYGEN UNIT DETAILS**
DISTRIBUTION

The gaseous oxygen is supplied from a high-pressure cylinder delivered at the operating pressure of 70 psi (4.8 bar).

The system comprises:

- the crew system including quick-donning masks with integrated regulator. The quick-donning masks are permanently supplied,

- the passenger system including masks which are automatically supplied by electro-pneumatic oxygen controller, the third crew member mask (if the airplane is not equipped with the third quick-donning mask as an option) and the first-aid sockets.

The oxygen cylinder supplies both systems.

FIGURE 02-35-10-08 OXYGEN DISTRIBUTION SCHEMATIC
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CONTROL

OVERHEAD PANEL

FIGURE 02-35-15-00 OVERHEAD PANEL ROTATING SELECTOR
SYNTHETIC TABLE

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>FUNCTION</th>
<th>SYNOPTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Control Diagram" /></td>
<td>CLOSED: the passenger system is fully isolated from the oxygen source. The masks are not allowed to fall down. The oxygen cylinder only supplies the crew system.</td>
<td><img src="image2" alt="Synoptic Diagram" /></td>
</tr>
<tr>
<td><img src="image3" alt="Control Diagram" /></td>
<td>NORMAL: normal in-flight position for automatic deployment of the passenger oxygen masks in case of depressurization.</td>
<td><img src="image4" alt="Synoptic Diagram" /></td>
</tr>
<tr>
<td><img src="image5" alt="Control Diagram" /></td>
<td>FIRST AID: this mode controls the delivery of oxygen to first-aid mask. A selection on the masks allows supply setting between 2 and 4 l/min. Automatic deployment of the passenger oxygen masks is still active.</td>
<td><img src="image6" alt="Synoptic Diagram" /></td>
</tr>
<tr>
<td><img src="image7" alt="Control Diagram" /></td>
<td>O’RIDE: this mode controls deployment of the passenger oxygen masks at any cabin altitude and the maximum oxygen pressure supply within the system.</td>
<td><img src="image8" alt="Synoptic Diagram" /></td>
</tr>
</tbody>
</table>
For airplane with M2418 - BS 61, the pilot may also use the FIRST AID mode:
- to save oxygen, with the first-aid 5 psi (0.34 bar) low pressure mode, after the deployment of the oxygen masks in the O’RIDE mode,
- to keep a minimum oxygen flow in the system after the deployment of the oxygen masks in the NORMAL mode (the oxygen flow is automatically stopped under 8,000 ft cabin altitude) for specific reasons (feeling of faintness).

The status light is automatically switched ON and the sign illuminates in cabin when oxygen is detected in the passenger system.

### QUICK-DONNING OXYGEN MASK REGULATOR

The mask incorporates a flow regulator to supply diluted or pure oxygen with or without overpressure.

The regulator controls are composed of:
- the N / 100% two-position tumbler switch:
  - N for normal operation, providing diluted oxygen (air-oxygen mixture function of cabin altitude, becoming pure oxygen above 30,000 ft),
  - 100% for pure oxygen whatever the cabin altitude. Push the switch to be in the 100% position.
- the EMERGENCY / TEST control knob featuring two functions:
  - EMERGENCY providing overpressure for protection against smoke and toxic gases, whatever the cabin altitude (to be only used with the N / 100% tumbler switch in the 100% position). Rotate the control knob to be in the EMERGENCY position,
  - TEST providing continuous flow for mask operating check: push and hold the control knob to stay in the TEST position; release the control knob to return to normal operation.
- the left red tab allowing oxygen to inflate the harness. Press the red tab to inflate the harness; release it to deflate the harness.
- the COMF toggle switch is used to adjust the inflatable harness in two ways, tight setting (default) or comfort setting.
To vent the smoke goggles:
- push the N / 100% tumbler switch into the 100% position,
- rotate the EMERGENCY / TEST control knob into the EMERGENCY position,
- open the vent valve located at the top of the oxygen mask by pulling the slide down until the red bands are fully visible.

FIGURE 02-35-15-02 QUICK-DONNING OXYGEN MASK VENTING VALVE CONTROL
Oxygen indications are displayed on the Multifunction Display Unit (MDU):

- ECS page,
- STAT page.

FIGURE 02-35-15-03  ENVIRONMENT CABIN SYSTEM SYNOPTIC INDICATION
The quantity of remaining oxygen is indicated in %. If the value is equal or above 40% the
digital readout is displayed green, otherwise the digital readout is black on amber background.

The vertical scale used to display oxygen pressure includes three tick marks, moving pointer
and digital readout. The vertical scale is linear and consists of a rectangle with four color
bands (bottom is red, next is amber, next is green, top is amber).

The range of the digital readout is 0 to 2,200 psi (0 to 151 bar).

![Oxygen Pressure Gauge Diagram]

**FIGURE 02-35-15-04 OXYGEN PRESSURE GAUGE**

Normal oxygen status:  
700 < pressure < 2,000 psi

Oxygen pressure getting low:  
200 < pressure < 700 psi

Oxygen pressure too low:  
pressure < 200 psi

Invalid

![Example Oxygen Pressure Gauge Diagrams]

**FIGURE 02-35-15-05 EXAMPLE OF OXYGEN PRESSURE GAUGE**

If oxygen pressure is invalid then the pointer, digital readout and "psi" label are removed from
the display.

The **PAX ON** message is displayed in the ECS synoptic, as soon as oxygen pressure is
detected in the passenger system (4 to 6 psi) (0.27 to 0.41 bar).
The amber CAS message **OXYGEN FAIL** is only displayed in the NORMAL mode. It is not activated in CLOSED / FIRST AID / O'RIDE modes and during take-off and landing.

The amber CAS message **OXYGEN FAIL** is displayed when:
- cabin altitude > 15,000 ft and **PAX ON** message not activated (when cabin altitude rises),
- cabin altitude > 10,000 ft and **PAX ON** message not activated (when cabin altitude decreases after a depressurization),
- cabin altitude < 10,000 ft and **PAX ON** message activated.

Oxygen cylinder pressure is also available in the MDU STAT page:

![FIGURE 02-35-15-06 STATUS PAGE]
| 02-35-15 | ATA 35 – OXYGEN | F2000EX EASY |
| PAGE 8 / 8 | CONTROL AND INDICATION | CODDE 1 |
| ISSUE 3 | | DGT94085 |

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**INTRODUCTION**

In the high-pressure system, the pressure reducing valve fitting the oxygen cylinder incorporates a blow out disc calibrated to rupture between 2,575 and 2,775 psi (177.5 to 191 bar).

In the low pressure system, a 90 psi (6.20 bar) rated safety valve prevents the system from overpressure.

Electrical circuit protection is provided by conventional trip-free circuit breakers located above the overhead panel.

**CIRCUIT BREAKERS**

![Circuit Breaker Diagram]

**FIGURE 02-35-20-00  OXYGEN CIRCUIT BREAKERS**
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INTRODUCTION

In the following, typical in-flight situations have been selected to help the crew to understand the symbols provided in the various panels and displays.

IN-FLIGHT OPERATION

FIGURE 02-35-25-00 ROTATING SELECTOR DURING NORMAL IN-FLIGHT OPERATION

FIGURE 02-35-25-01 ECS SYNOPTIC DURING NORMAL IN-FLIGHT OPERATION

<table>
<thead>
<tr>
<th>NORMAL STATE</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead panel rotating selector on NORMAL position</td>
<td>Automatic oxygen supply and automatic passenger masks drop in case of depressurization</td>
</tr>
</tbody>
</table>
CREW MEMBER QUICK-DONNING OXYGEN MASK REGULATOR OPERATION

QUICK-DONNING

With the mask stowed in the box, firmly grasp the red tabs.

FIGURE 02-35-25-02 OPERATION 1

Pull the mask completely out of the stowage box without inflating the harness.

FIGURE 02-35-25-03 OPERATION 2

Depress the inflation control valve (red tab) with thumb and forefinger to inflate the harness. Keep control depressed.

FIGURE 02-35-25-04 OPERATION 3

Position the harness over the head. Lower the mask with a wide arc from the brow to the chin.

FIGURE 02-35-25-05 OPERATION 4
With the mask firmly secured in the hand away from the face, release thumb and forefinger from inflation control valve (red tab), which deflates the harness, and guides the mask assembly to the face.

To achieve optimum fit, simply re-inflate the harness by depressing the inflation control valve (red tab) and adjust mask as needed.

To breathe with emergency positive pressure, place the N / 100% tumbler switch to 100% and turn clockwise the control knob to EMERGENCY.

To operate in comfort operation, switch the toggle over to COMF position.

to return in normal operation,
- switch the toggle back to NORM position and depress the inflation control to inflate the harness.

**NOTE**

In case of an emergency with a released harness, switch the toggle back to the NORM position. The harness will immediately deflate and will apply its full tension to the user’s head.
MASK STOWAGE

To store the oxygen mask regulator in the stowage box:
- open the stowage box door,
- ensure pneumatic and electrical connector of the mask regulator are properly connected with the mating receptacles of the stowage box,
- make sure the harness is released and properly positioned behind the face piece,
- grasp the mask regulator,
- coil the hose and position it at the bottom of the stowage box,
- press the harness into the stowage box, beginning with the back of the harness and position the hose to the middle to ensure proper alignment when doors are closed,
- install the mask regulator in the stowage box and make sure it is fully seated against the stop in the stowage box,
- close the door LH side which features a metal mask retaining spigot,
- insert the spigot in the hole of the regulator red tab,
- close the RH door.

NOTE

The oxygen mask regulator has to be stored with the N / 100% tumbler switch on the 100% position and with the EMERGENCY / TEST control knob NOT in the EMERGENCY position.

NOTE

Improper procedures in service may cause wearing and/or jamming of the inflatable harness and difficulties to perform next donning.
SMOKE GOGGLES OPERATION

The purpose of the vent valve is to provide a sufficient amount of flow into the face piece to protect the user from smoke and toxic gases and also to prevent the lens from mistiness.

Don the mask regulator.

Push the N / 100% regulator tumbler switch into 100% position and rotate the EMERGENCY / TEST control knob into EMERGENCY position.

Don and securely fit the goggles to the face piece.

Pull upper harness tubes and reposition it over goggle frame lower sides.

Only if necessary, adjust goggles nose bridge by pressing each side of the bridge inward.

Open vent valve by pulling the slide down until red bands are fully visible.
PROTECTIVE BREATHING EQUIPMENT OPERATION

1. REMOVE UNIT FROM STORAGE CONTAINER
2. TEAR OFF RED PULL STRIP AND REMOVE UNIT FROM PLASTIC PROTECTIVE WRAPPER
3. PULL ACTUATION RING IN THE DIRECTION INDICATED
4. HOLD THE DEVICE BY THE OPEN END OF THE HOOD WITH THE LIFE SUPPORT PACK AWAY FROM THE USER
5. BEND OVER AND GRASP HOOD OPENING WITH THUMB AND PULL HOOD OVER HEAD
6. THE SOLID STATE OXYGEN GENERATOR ENSURES A MINIMUM FLOW FOR 15 MN

FIGURE 02-35-25-13 PROTECTIVE BREATHING EQUIPMENT OPERATION
PASSENGER OXYGEN MASK OPERATION

1. Mask drops automatically

2. Pull on the mask to release the oxygen, put strap over head

3. Fit mask over nose and mouth, tighten strap and breathe normally
PORTABLE OXYGEN BOTTLE OPERATION (OPTIONAL)

Connect the mask(s),

Open the valve to pressurize the system:
- passenger mask couplings with continuous flow (autonomy is 15 minutes in normal procedure),
- the two couplings can be used simultaneously if necessary.

After use:
- close the valve,
- disconnect the hose from the mask,
- fit the caps on the couplings.

FIGURE 02-35-25-14 PORTABLE OXYGEN BOTTLE OPERATION
INTRODUCTION

In the following, typical abnormal situation has been selected to help the crew to understand the symbols provided in the various panels and displays.

AIRPLANE FLYING WITH OVERRIDE OPERATION OF PASSENGER MASKS

FIGURE 02-35-30-00 OVERHEAD PANEL

<table>
<thead>
<tr>
<th>KNOB POSITION</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>O’RIDE</td>
<td>Forces the passenger masks to fall down and supplies the maximum oxygen pressure</td>
</tr>
</tbody>
</table>

FIGURE 02-35-30-01 ECS SYNOPTIC DURING OVERRIDE OPERATION
### CAS MESSAGE

<table>
<thead>
<tr>
<th>CAS MESSAGE</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>OXYGEN FAIL</td>
<td>Failure of passenger oxygen delivery system in NORMAL mode</td>
</tr>
</tbody>
</table>