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INTRODUCTION

The Oxygen System is designed to allow oxygen storage and distribution to passengers, and crew. Cockpit installation includes quick donning masks, mask stowage cups and smoke goggles for aircrew protection. Oxygen storage and distribution includes a cylinder(s) to store oxygen, supply regulated pressure, equipment for cylinder servicing such as refilling and discharge indication, distribution to the cockpit and passengers, including therapeutic masks.

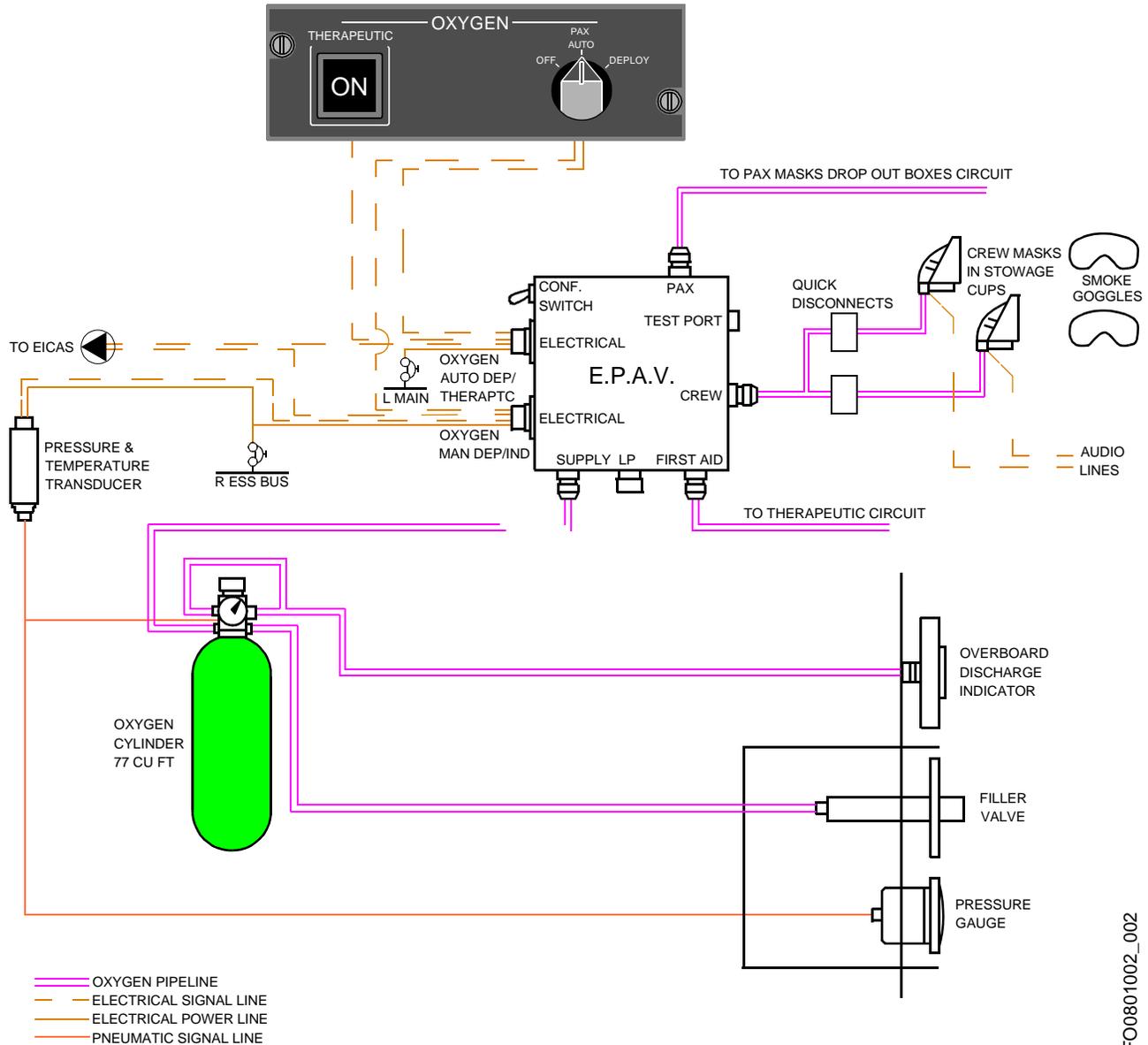
The following equipment is provided to deal with specific emergencies: Smoke goggles, personal breathing equipment, life vests, crash axe, flashlights, first aid kit and portable fire extinguishers.

OXYGEN SYSTEM

DESCRIPTION

Oxygen is stored in gaseous form in one or two cylinders, and delivers oxygen at a reduced pressure to the electrical pneumatic actuating valve (EPAV). The EPAV supplies oxygen to the crew masks, passenger drop out boxes and therapeutic mask. It optimizes the passenger oxygen consumption and gives system information to the EICAS.

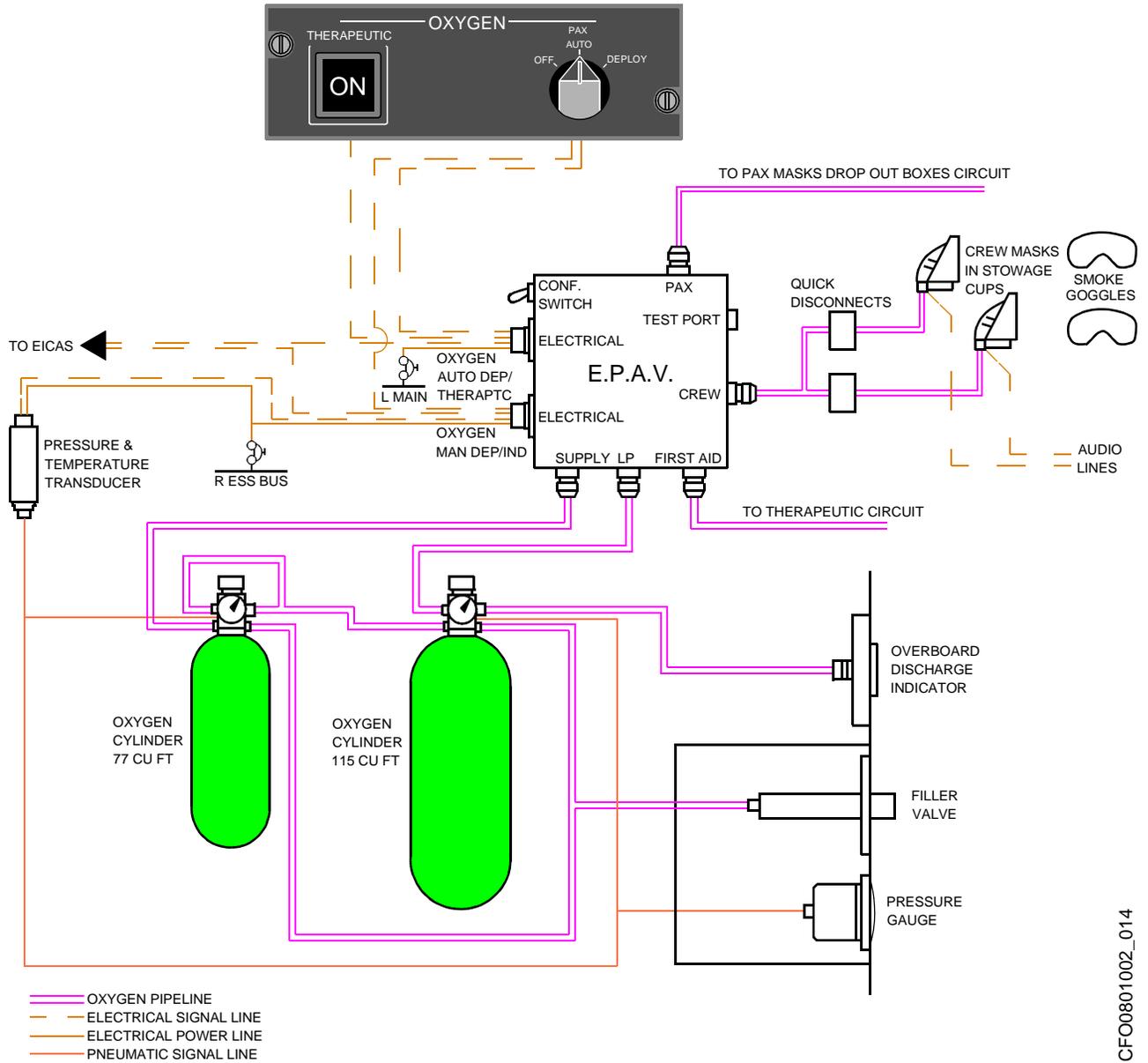
OXYGEN SYSTEM — BASELINE CONFIGURATION



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OXYGEN SYSTEM (Cont)

OXYGEN SYSTEM — OPTIONAL CONFIGURATION



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OXYGEN SYSTEM (Cont)

COMPONENTS AND OPERATION

The flight deck oxygen system consists of two stowage containers attached to the crew seats, and two quick-donning type oxygen masks.

A manifold system delivers oxygen to crew oxygen masks. When supplemental oxygen is needed, or when the air contains toxic fumes, each crew member has access to individual quick-donning masks located in a container behind each crew station. A regulator attached to each oxygen mask provides three selectable supply modes: NORMAL diluted demand, 100% pure oxygen on demand, and EMERGENCY. One portable breathing equipment (PBE) container is located behind the pilot's station on the bulkhead near the floor.

OXYGEN CYLINDER

The basic oxygen system includes one 77 cu ft (2183 liters) cylinder. A second 115 cu ft (5458 liters) cylinder is available as an option for long distance flight capability. Both cylinders are equipped with the same regulator for supplying reduced pressure to the distribution circuit.

Both oxygen cylinders are composite cylinders with a pressure reducing regulator mounted directly on top and manually operated through an on/off toggle. Oxygen is stored in the cylinder at high-pressure. The regulator reduces high-pressure oxygen to a lower suitable pressure for use with passengers, therapeutic and crew masks.

The cylinder and regulator assembly is installed inside a dedicated compartment in the lavatory section (right side). The cylinder includes safety relief valves (one on the high-pressure line and another on the reduced pressure line) and are connected to discharge lines and to the overboard discharge indicator.

A temperature and pressure transducer provides the oxygen compartment ambient temperature and the oxygen pressure in the cylinder(s) to the EPAV. Based on these two signals the EPAV generates a temperature-compensated pressure signal and sends it to the EICAS. According to the number of cylinders installed on aircraft, the EICAS converts the pressure signal into liters of oxygen for display of oxygen quantity in the cockpit.

When fully charged, the oxygen system pressure is 1850 psi. The quantity is continuously monitored and displayed on the EICAS and SUMMARY synoptic pages. When the quantity of the cylinder is less than 700 liters the readout changes to amber and the OXYGEN QUANTITY LOW (C) CAS message is displayed. The message is based on temperature corrected pressure.

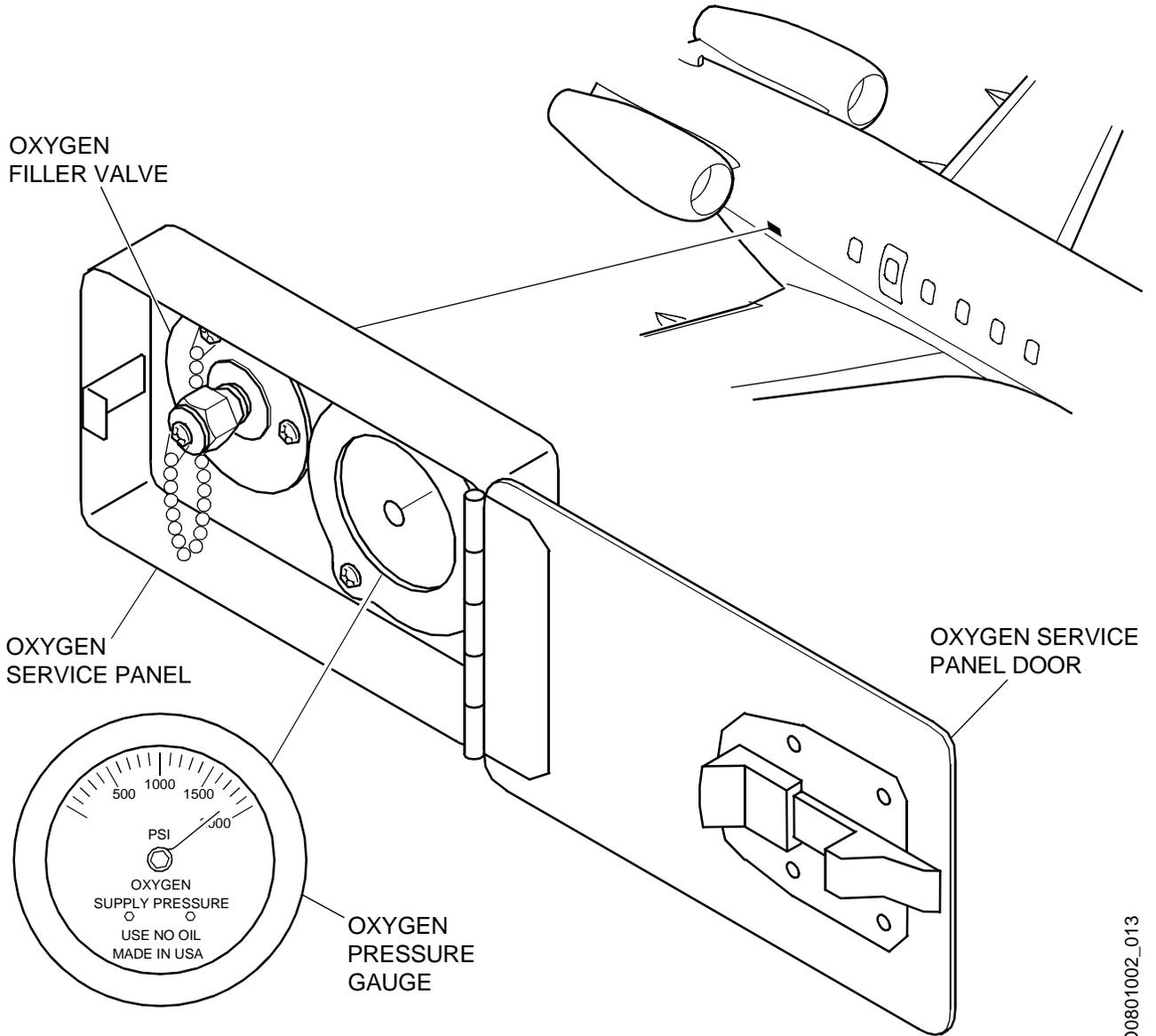
OVERBOARD DISCHARGE INDICATOR

The shutoff and pressure regulator system incorporates a pressure relief valve to discharge the oxygen cylinder contents overboard in the event of excessive oxygen pressure. Should the contents be discharged overboard, the green overboard discharge indicator located above the oxygen servicing panel on the right side of the aircraft will be ruptured or missing.

OXYGEN SYSTEM (Cont)

OXYGEN SERVICE PANEL

The oxygen service panel is located on the right side of the fuselage directly forward of the right engine. The oxygen service panel has a filler valve and a pressure gauge. Replenishment of the oxygen system is a maintenance function.



OXYGEN SYSTEM (Cont)

SMOKE GOGGLES

Smoke goggles provided for both flight crew members and are designed to be used in conjunction with the EROS crew oxygen mask. The goggles are equipped with a vent-valve, and provide smoke and toxic gas protection for crew members.

The goggles are composed of a polycarbonate molded lens and coated with anti-misting and scratch resistant coatings. However, the goggles should be kept in a protective bag to minimize inadvertent scratching. The goggles are equipped with an adjustable headband and a flexible silicone molded seal allows the wear of corrective eyewear or sunglasses.

The goggles are located in storage bins on the side console outboard of each crew station.

FLIGHT CREW OXYGEN MASK AND STORAGE CUP

The flight crew masks are stowed in accessible stowage cups over each crew member's outboard shoulder.

FLIGHT CREW OXYGEN MASK STOWAGE AND HARNESS FOLDING INSTRUCTIONS

The instructions for stowage and removal of the crew oxygen mask are shown below. When stowing the mask, it is important not to stuff the harness into the nosepiece cavity, as this could impede donning of the mask.

Another view is shown for clarity, and the instructions are as follows:

1. Insert the mask so that the face piece goes in the cup under the retaining tabs as detailed in Figure A.
2. Once the face piece is in the cup, rotate the top of the mask out until the face piece is resting against the retaining tabs as detailed in Figure B. The mask should be in an upright position ready for clicking home.
3. Push the mask in the cup until it clicks home on both sides of the cup as detailed in Figure C.

NOTE: Failure to properly perform step 2 before pushing the regulator into place will result in the face piece being subjected to possible damage.

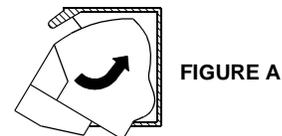
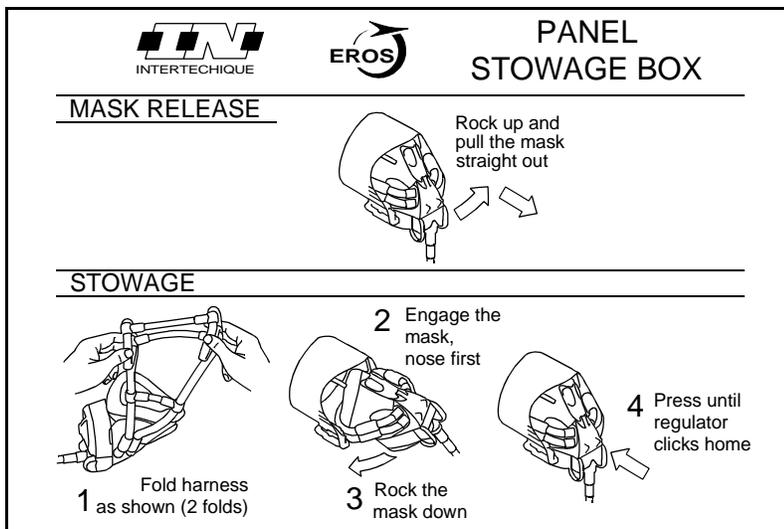


FIGURE A

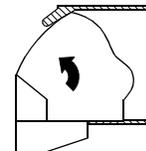


FIGURE B

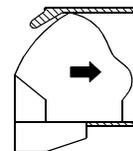


FIGURE C

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FLIGHT CREW OXYGEN MASK COLD WEATHER STORAGE

If the aircraft is to be parked for an extended period at ambient temperatures of -5°C (23°F) or below, it is recommended that the oxygen be turned off, the crew oxygen masks disconnected and stowed in a heated room, or the cabin warmed to at least $+15^{\circ}\text{C}$ (59°F) before use.

OXYGEN SYSTEM (Cont)

CREW OXYGEN MASK

The crew oxygen masks are quick-donning masks with an oxygen regulator, an inflatable harness and a microphone. The facepiece is equipped with a venting system located on the bridge of the nosepiece. It opens automatically when smoke goggles are worn to ensure smoke protection.

The NORMAL, 100%, EMERGENCY, and PRESS TO TEST knob is located on the bottom of the mask to check the oxygen supply when the mask is stowed in its storage container. It can be also used to provide positive pressure for smoke protection at any altitude.

The crew oxygen masks are only required to function (oxygen flow and test) at -5 °C and warmer. If the cabin has been allowed to cold soak below this temperature, it may be necessary to warm the cabin prior to testing the masks during the preflight inspection.

NORMAL

When the control knob is in the normal (N) position, the oxygen supplied to the mask is a mixture of ambient air and pressurized oxygen. In this position, the operator can turn the flow control knob to adjust the flow.

100%

When the control knob is in the 100% position, the mask is provided with pure oxygen.

EMERGENCY

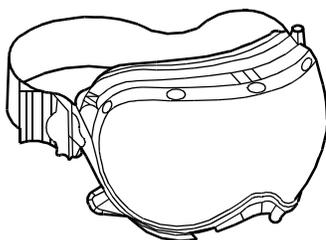
The emergency flow control knob is also located on the regulator unit. If the knob is turned clockwise to the EMERGENCY position, the mask supplies a constant flow of oxygen at a permanent positive pressure. At high cabin altitude (above 35 000 ft) the mask supplies only pure oxygen at a constant flow, regardless of the knob position.

PRESS TO TEST

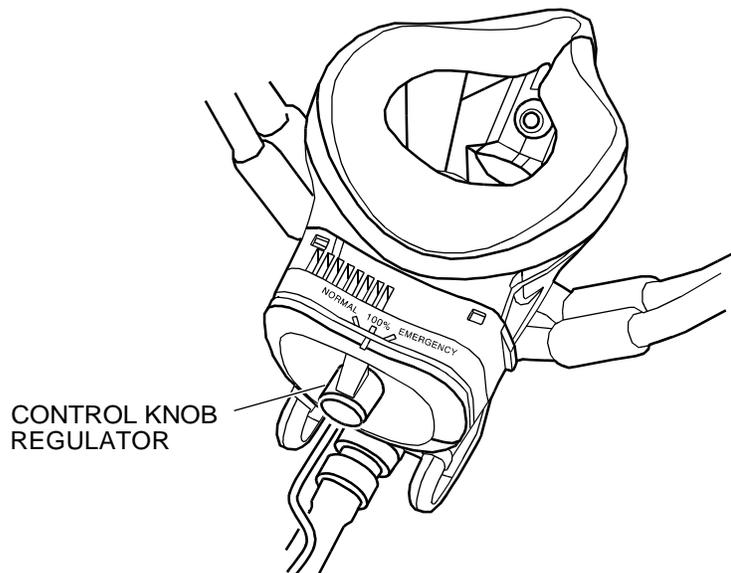
When the press to test button is pushed, oxygen is momentarily supplied to the mask and the hose flow indicator will change color.

INFLATABLE HARNESS CONTROL

The oxygen mask is extracted from the stowage box by gripping the plates of the regulator, which protrude out of the box. When the two red tabs on the mask are squeezed, the harness inflation valve will open permitting the harness to inflate. When the tabs are released, the harness deflates and the mask holds tightly against the operator's face.



SMOKE GOGGLES



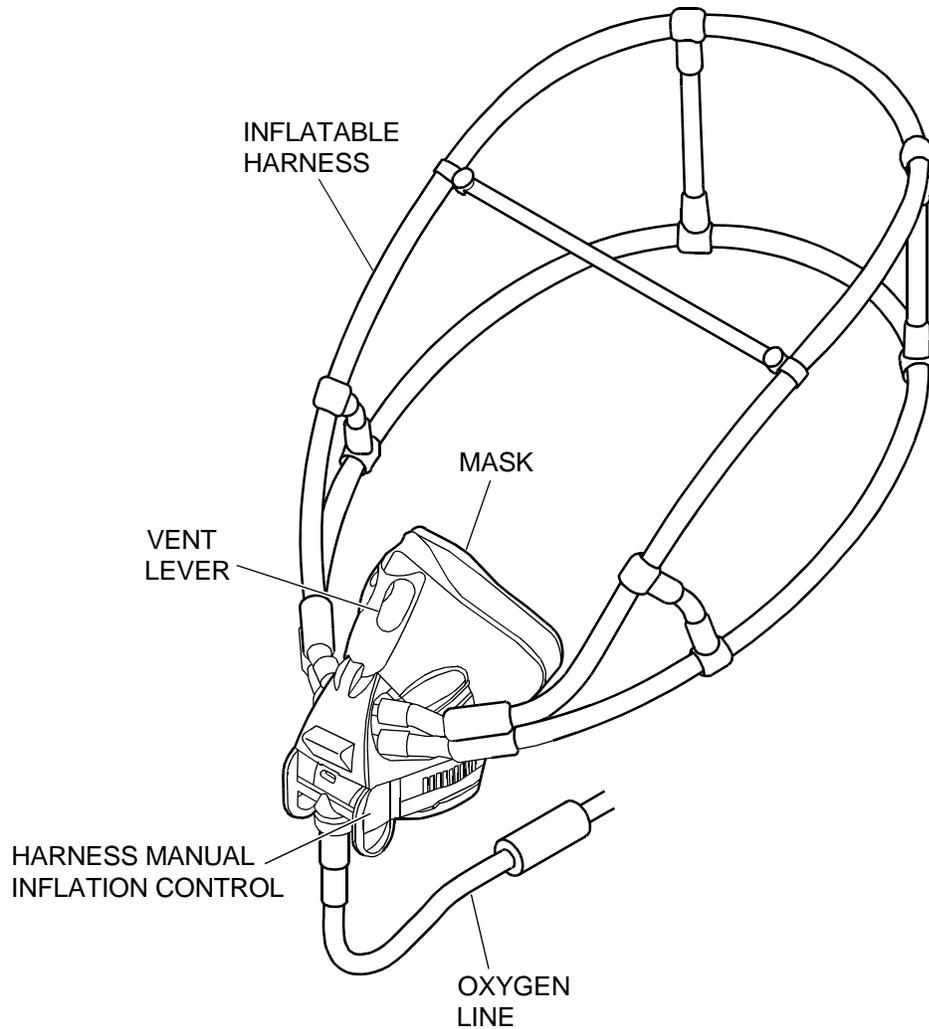
CREW OXYGEN MASK

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OXYGEN SYSTEM (Cont)

MICROPHONE CONTROL

When the O2 MASK/NORM switch on the associated audio control panel is selected to O2 MASK, the microphone in the mask is activated.

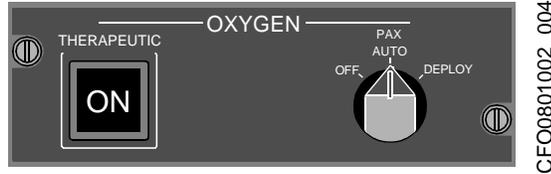


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PASSENGER OXYGEN SYSTEM

DESCRIPTION

The passenger and crew oxygen systems are supplied by the same oxygen cylinder(s) during cabin depressurization. The passenger masks will automatically deploy, however, they can be manually deployed from the flight deck at any time by selecting DEPLOY on the PAX switch on the OXYGEN control panel.



COMPONENTS AND OPERATION

ELECTRICAL PNEUMATIC ACTUATING VALVE (EPAV)

The electrical pneumatic actuating valve (EPAV) controls oxygen availability to the passenger oxygen distribution system and provides for automatic or manual mode selection. The control is a three-position PAX switch on the OXYGEN panel labeled OFF, PAX AUTO, and DEPLOY.

When the passenger masks are deployed (automatically or manually), a PAX OXYGEN ON CAS (S) message appears. If a failure of the passenger oxygen valve is detected, a PAX OXYGEN AUTO FAIL(C) CAS message appears.

AUTOMATIC DEPLOYMENT

With the switch selected to AUTO, the passenger oxygen masks automatically deploy if the cabin altitude climbs to 14,500 ft \pm 500 ft. Flow continues until cabin altitude drops below 9500 ft \pm 500 ft.

MANUAL DEPLOYMENT

Setting the oxygen switch to the DEPLOY position manually opens the passenger oxygen valve and allows oxygen pressure to flow to the passenger masks. This position will deploy the passenger masks at any cabin altitude.

With the switch indicator in the OFF position, oxygen is not available to the passenger distribution system regardless of cabin altitude.

THERAPUTIC OXYGEN

Therapeutic low pressure oxygen is available to the passenger cabin. The outlet is located approximately midway in the cabin on the right side. Therapeutic oxygen is controlled by the THERAPUTIC switch located on the OXYGEN panel.

MASK CONTAINERS

Each mask container consists of a door, two masks, and a latch mechanism. Containers are installed above each pair of passenger seats. There is also a mask container in the lavatory located on the bulkhead.

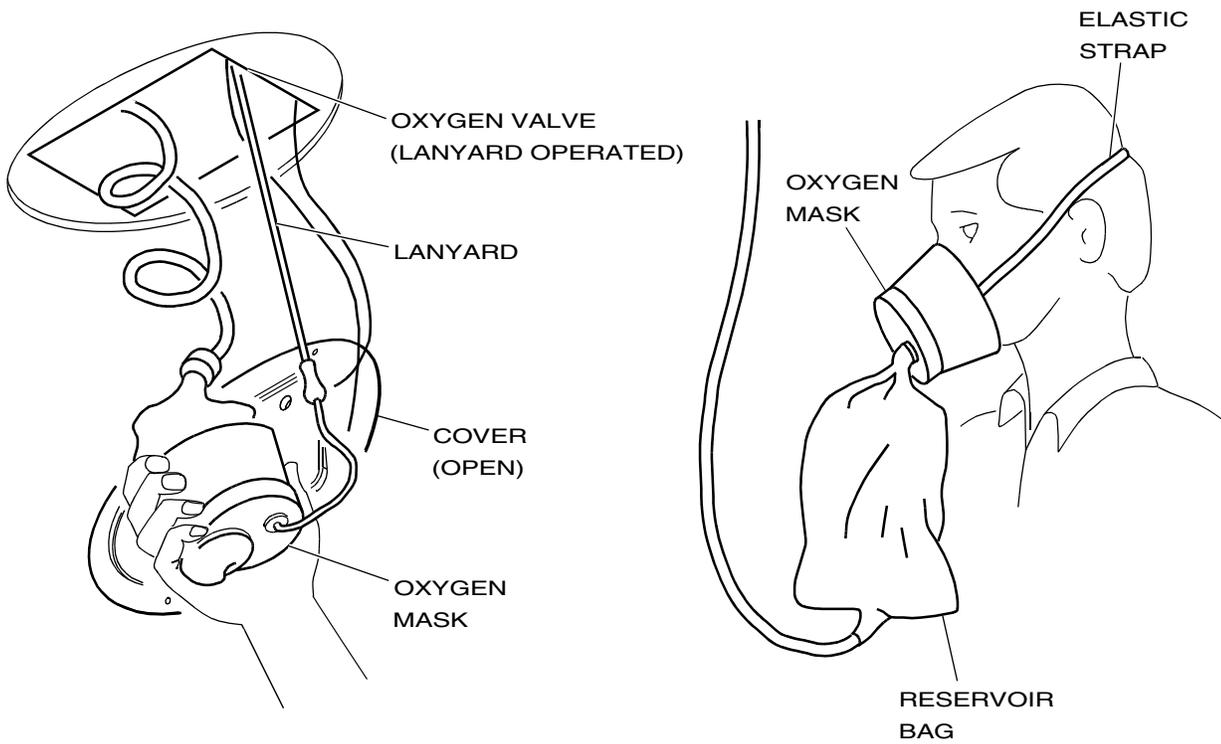
The latch mechanism can be operated manually or electrically. When the latch mechanism is released, the door opens and the masks drop down.

PASSENGER OXYGEN SYSTEM (Cont)

PASSENGER MASKS

The passenger oxygen masks consist of a soft silicone rubber face piece with a reservoir air bag. The reservoir bag incorporates a green chamber which inflates when oxygen flows to the mask.

When the oxygen masks drop, passengers should don masks and pull the mask lanyard to initiate oxygen flow. The masks will provide a constant flow of oxygen to the passenger. The mask must be placed over the nose and mouth and is held in place with an elastic strap.



CFO0801002_012

EMERGENCY EQUIPMENT

DESCRIPTION

The Challenger 300 is equipped with safety equipment that is essential to the safety of passengers and crew.

COMPONENTS AND OPERATION

FLIGHT DECK EMERGENCY EQUIPMENT

The flight deck is equipped with:

- 2 flashlights
- 1 Portable breathing equipment (PBE)
- 1 Crash axe
- 1 Fire extinguisher
- 2 life vests

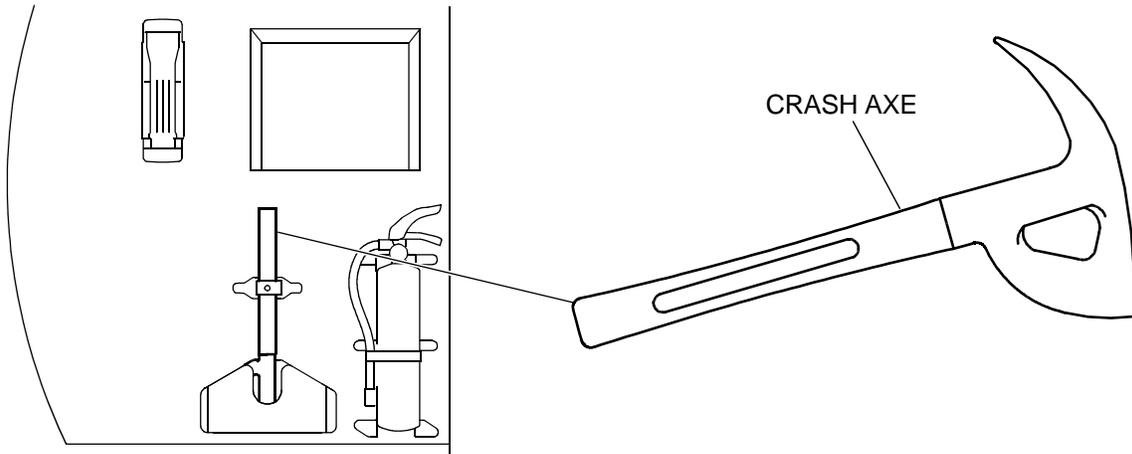
PASSENGER CABIN

The passenger cabin is equipped with:

- 1 First aid kit
- 1 Flashlight
- 2 Fire extinguisher (lavatory and forward closet)
- 1 life vest under each seat
- 1 Portable breathing equipment (PBE)

CRASH AXE

The crash axe is behind the copilot seat.



CFO0801002_005

PORTABLE FIRE EXTINGUISHER

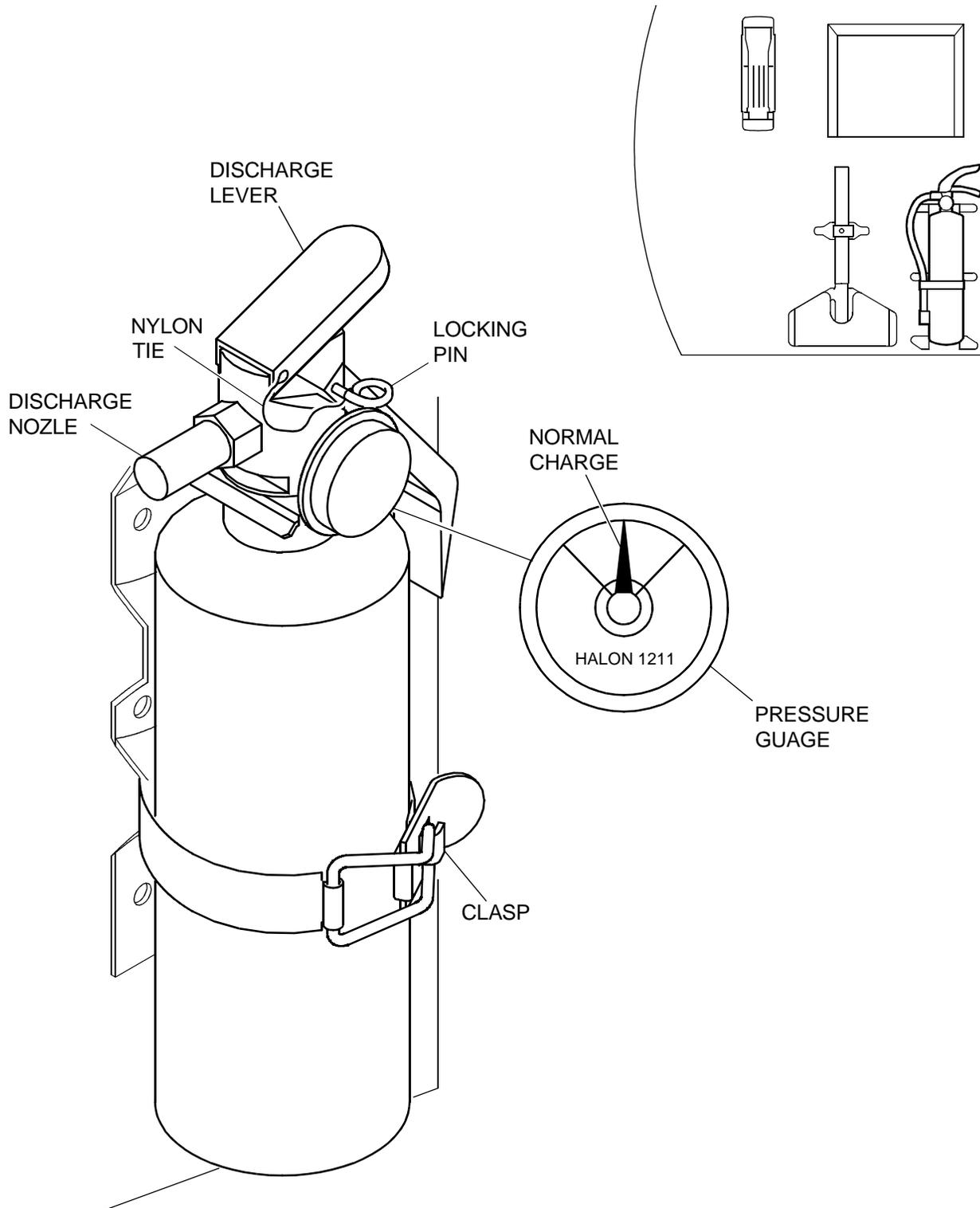
The hand-operated fire extinguisher, located in the flight compartment, contains Halon 1211. Halon 1211 is effective on electrical, oil, and fuel fires, and is suitable for use in cold weather.

To operate: Remove from stowage bracket. Hold extinguisher upright in either hand, slide the locking pin down with thumb, aim the nozzle towards the base of the fire and press lever. Discharge stops when the lever is released. Ventilate the compartment promptly after successfully extinguishing the fire to reduce gases produced by fire and Halon. If the discharge lever is held in the ON position, the extinguisher is fully discharged in 10 seconds.

WARNING: If a fire extinguisher is discharged in the flight compartment, all flight crew must wear oxygen masks with EMERGENCY selected (100% oxygen). Crew exposure to high levels of Halon vapor may result in dizziness, impaired coordination, and reduced mental sharpness.

The fire extinguisher is effective in fighting Class A, B, and C fires.

EMERGENCY EQUIPMENT (Cont)



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EMERGENCY EQUIPMENT (Cont)

PROTECTIVE BREATHING EQUIPMENT

Protective breathing equipment (PBE) is available for a crew member to use in fighting cabin fires. The PBE is designed to protect the user’s eyes and respiratory system from the harmful atmosphere which may be generated by a cabin fire. The PBE consists of a hood with a visor which is placed over the head and seals around the neck. An oxygen generating canister provides breathing oxygen for the user. The PBEs are vacuum sealed in a bag and stored in a box behind the pilot’s station and in the lavatory. The PBE is a throw-away unit that must be replaced whenever the vacuum seal is broken. It is imperative that the vacuum seal be maintained since the oxygen-generating chemicals react with moisture.

Duration of oxygen production is nominally 15 minutes depending upon the work rate and size of the user. Useful life of a sealed PBE is 10 years from the date of manufacture.

NORMAL OPERATION

Donning the PBE:

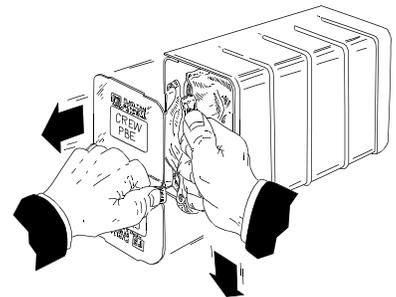
The PBE is mounted on the bulkhead behind the pilot’s seat. Some aircraft may have a second portable carrier stowed in a cabinet in the cabin area.

1. Removing mask from container.
 - a. To open the portable container, lift the single latch on the cover and lift. Remove sealed bag from the container.
 - b. On the mounted container, grasp the red access handle on the protective container firmly and pull forcibly to disengage the cover. When the cover is removed from the container, immediately drop it. (The vacuum sealed bag does not need to be removed from the container to open.) The packaged unit may be removed from the stowage container prior to opening and carried to a remote location for use.

Portable
Container

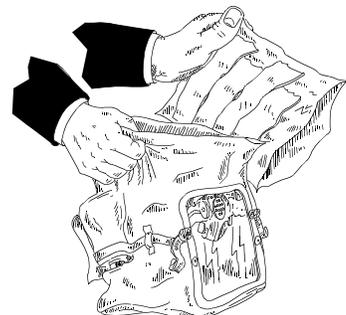


Mounted
Container



STEP 1

2. To remove the PBE from the vacuum sealed bag, locate the red I.D. tag and pull sharply to tear open the vacuum sealed bag. Reach into the opened vacuum-sealed bag and firmly grasp the PBE. Pull the PBE straight out of the bag. If necessary hold the bag with the opposite hand.



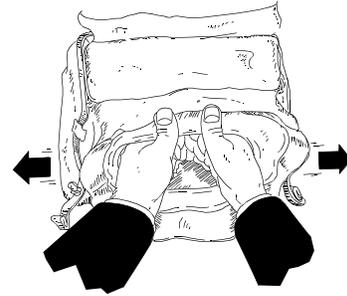
STEP 2

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EMERGENCY EQUIPMENT (Cont)

PROTECTIVE BREATHING EQUIPMENT (Cont)

3. Place both hands inside the neckseal opening with palms facing each other and PBE visor facing downward with the oxygen generating canister resting on the tip of the hands.



STEP 3

4. With the top of the head bent forward, guide the PBE neckseal over the top of the head and down over the face using the hands to shield the face and glasses from the oronasal mask cone.

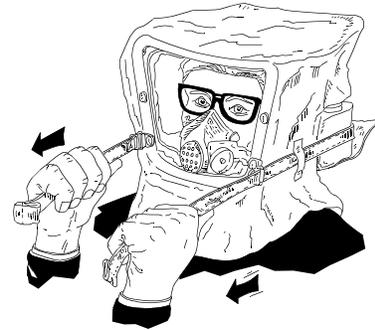


STEP 4

5. With both hands, grasp the adjustment straps at the lower corners of the visor and pull outward sharply to actuate the starter candle. Within 1-5 seconds, a rushing noise of oxygen entering the hood will be heard and inflation will be evident.

WARNING

Human hair is highly flammable. Hair that protrudes through the neckseal could ignite if brought into direct contact with flame.



STEP 5

6. With the straps still in hand and head bent forward, pull backward to secure the oronasal mask cone high on the nose for a tight seal.

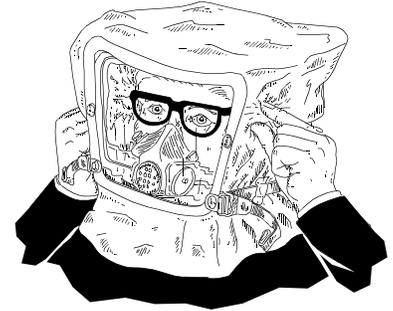


STEP 6

EMERGENCY EQUIPMENT (Cont)

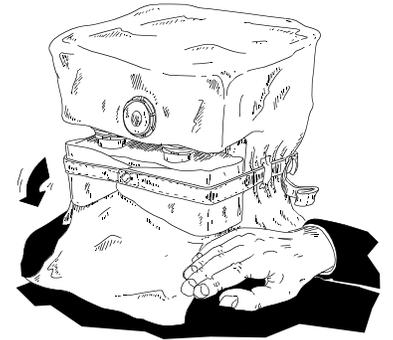
PROTECTIVE BREATHING EQUIPMENT (Cont)

7. If wearing glasses, you may adjust their position to rest on the tip of the oronasal mask cone by moving the sides of the frame through the hood fabric. Do not attempt to adjust through the neckseal as this will result in infiltration of the surrounding atmosphere into the interior of the hood.



STEP 7

8. When the neckseal is positioned at the neck and the oxygen generating canister is resting on the nape of the neck, remove the hands, checking to see that clothing is not trapped in the seal and hair does not protrude between the seal and the neck. Pull the protective neck shield down to cover the collar and upper shoulder area.



STEP 8

Following actuation, the hood will inflate over a 15-20 second period. After this period, the starter candle will cease flowing and the only sound will be a slight rustling of the fabric on each inhalation and exhalation. Dependent upon breathing rate, there will be a slight exhalation resistance as the exhaled breath is forced through the oxygen generating canister. Inhalation resistance will be almost unrecognizable since inhalation is directly from the interior of the hood through a diaphragm type check valve located at the base of the oronasal mask. The visor should remain clear of fogging or misting. Heat is produced by both the chemical air regeneration process and transfer of body heat during the rebreathing cycle. Heat build-up within the hood is normal and is dependent upon the amount of work performed. There should be no irritating or strong unusual odors within the hood. Operational duration is variable dependent upon the amount of work performed by the user.

If the PBE is worn to exhaustion of the chemical regeneration system, this will be evidenced by a gradual reduction in the expended volume of the hood until the point that the hood is collapsed tightly around the head at the end of a full inhalation. Additionally, there will be a rapid buildup of heat and moisture in the hood as the canister loses its effectiveness. At this point, the wearer should immediately retire to a safe breathing area clear of flame and toxic fumes and remove the device.

Removing the PBE

1. Go to a safe area away from immediate contact with fire or open flame and/or toxic fumes.
2. With both hands, reach for the two lower corners of the visor area and push forward on the metal tabs of the adjustment strap buckles to release the strap tension.
3. Place both hands under the neckseal in the forward area and pull up, guiding the oronasal cone and neckseal over the face/glasses until the PBE is clear of the head.
4. Place the expended PBE in a safe place to cool away from fire or exposure to water.

Disposal

The expended PBE still contains unreacted oxidizing material and strong alkali materials. At the completion of flight, it must be turned over to maintenance for authorized disposal.

EMERGENCY EQUIPMENT (Cont)

ABNORMAL CONDITION OF OPERATION



This device produces oxygen which will vigorously accelerate combustion. Do not intentionally expose the device to direct flame contact, or remove in the immediate presence of fire or flame. Due to oxygen saturation of the hair, do not smoke or become exposed to fire or flame immediately after removing.

Users should be trained to recognize abnormal conditions which could signify malfunction or failure of the equipment to properly operate as follows:

Failure Of The Starter Candle

If the starter candle fails to actuate when the adjustment strap is pulled, an additional sharp pull on the strap may be sufficient to dislodge the lanyard pin and actuate the device. If the device still fails to actuate, the hood will continue to function, although the initial purge capability is lost. Sticking the fingers into the neckseal to allow a large lung inhalation may be required to enable sufficient breathing volume until the chemical regeneration system begins producing a surplus of oxygen.

Inadequate Oronasal Mask Seal

Absence of a tight seal of the oronasal cone to the face may result in excess leakage of the exhaled breath into the hood, short circuiting the oxygen-generating canister. This condition may result in a build-up of CO₂ within the rebreathing volume in the hood. Excessive CO₂ is normally indicated by breathing distress such as rapid and labored breathing accompanied by a general feeling of insufficient ability to get one's breath, although there is no restriction to breathing. Presence of moisture or fogging on the visor and the sensation of air escaping from the mask, particularly around the nose and eyes, are indications of a lack of proper fit. Adjustment of the mask straps and mask position to minimize leakage should rapidly alleviate the problem. If the perception of breathing distress persists, the user should quickly go to a safe area and remove the PBE and don alternate breathing equipment if required.

Loss Of Infiltration Seal

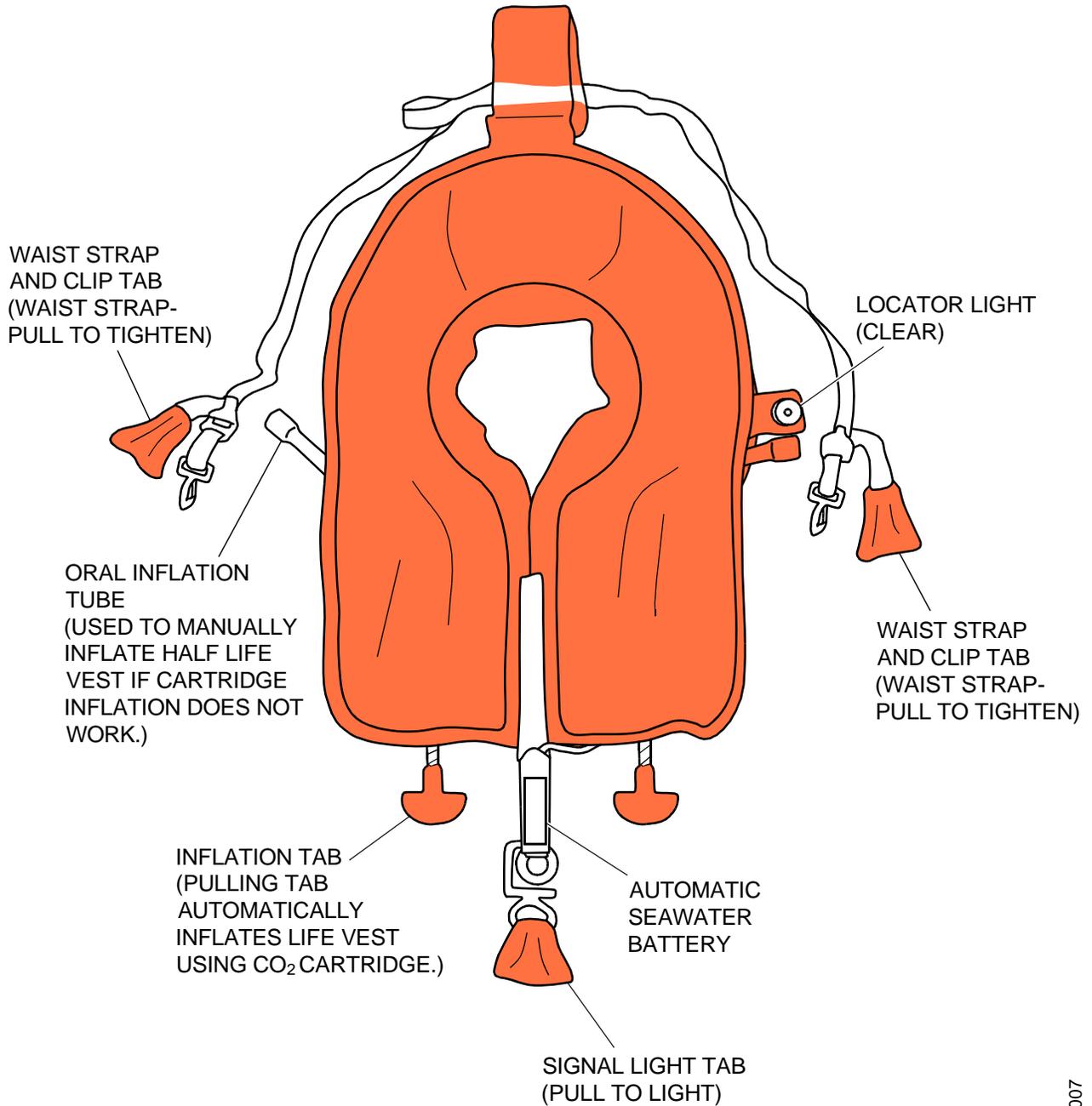
The smoke and toxic fumes generated by the combustion of most aircraft cabin interior materials has many strong irritants. The continued presence of strong irritation odors inside the hood resulting in eye and respiratory tract discomfort is a good indicator of the lack of an effective infiltration seal. Verify that the seal is in contact with the skin or the neck and does not have clothing or jewelry trapped in the seal, or hair protruding between the seal and the neck. If the condition persists, or there is evidence of a tear in the neckseal, the user should go quickly to a safe area and don alternate breathing equipment if required.

EMERGENCY EQUIPMENT (Cont)

OVERWATER EMERGENCY EQUIPMENT

LIFE VEST

Life vests are provided for crew and passengers. Flight crew life vests are located under the pilot and copilot's seats. The passenger life vests are located in a compartment under each passenger seat. The life vests are inflated by pulling the red CO₂ release tabs. An oral inflation tube is also available if the CO₂ cartridge does not inflate the vest.



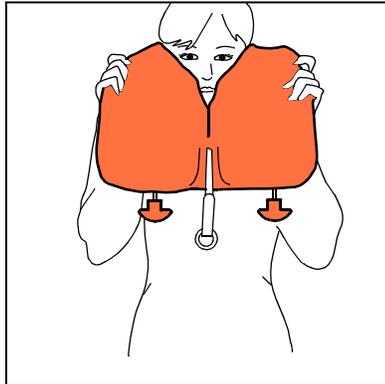
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EMERGENCY EQUIPMENT (Cont)

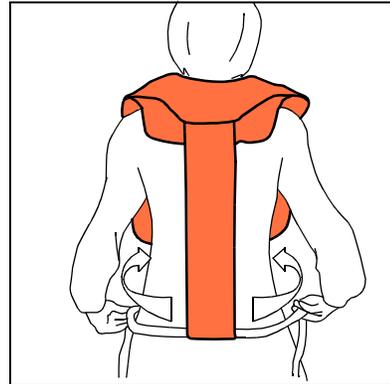
To don the life vest, proceed as follows:



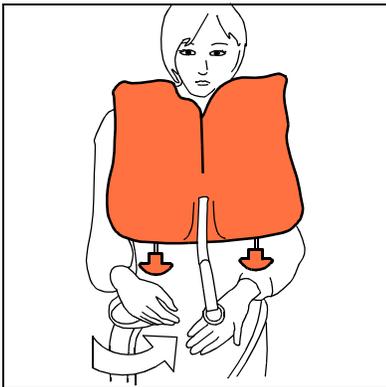
1. FIND THE LIFE VEST UNDER THE SEAT.



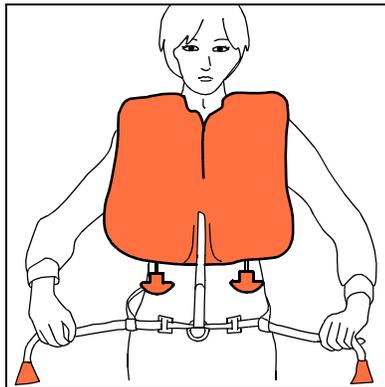
2. PUT THE LIFE VEST OVER HEAD...



3. ...WITH THE BACK PIECE BEHIND.



4. FASTEN RINGS TO CATCH

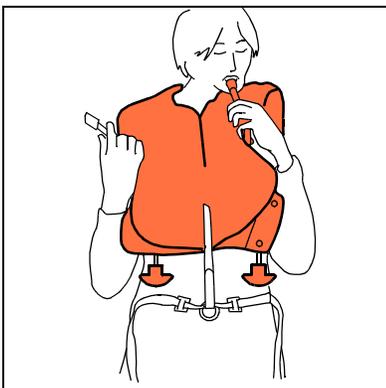


5. PULL STRAPS TIGHT



6. JERK DOWN ON INFLATION TABS.

INFLATE LIFE VEST JUST BEFORE JUMPING OUT OF THE AIRPLANE!
USING OVERWING EMERGENCY EXIT INFLATE LIFE VEST WHEN ON THE WING.



7. SHOULD IT BECOME NECESSARY, LIFE VEST CAN BE ORALLY INFLATED BY BLOWING INTO ORAL INFLATION TUBES.

NOTE

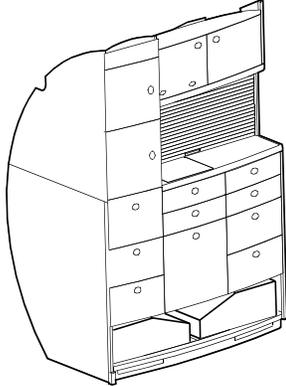
When using adult/child life vest for children, pass the straps between legs, fasten hooks. Inflate only one chamber.

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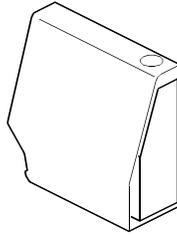
EMERGENCY EQUIPMENT (Cont)

LIFE RAFTS (OPTIONAL)

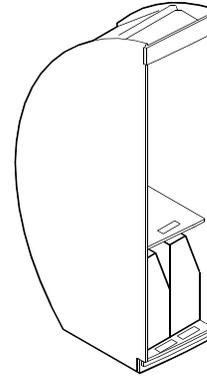
Two optional self contained 4 person life rafts are provided for passengers and crew. They are located either on the bottom shelf of the galley, crew closet, or in the aft pyramid cabinet, depending on cabin configuration. Refer to *Air Cruisers Company Operator's Guide* for further information.



(DOORS REMOVED FOR CLARITY)
DELUXE GALLEY



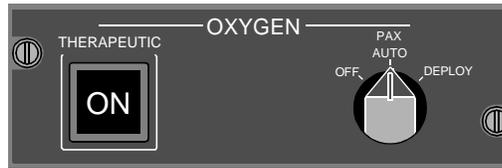
(DOOR REMOVED FOR CLARITY)
PYRAMID CABINET



(DOOR REMOVED FOR CLARITY)
CREW CLOSET

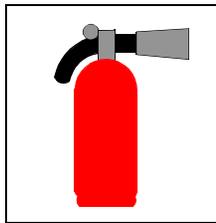
CONTROLS AND INDICATIONS

PASSENGER OXYGEN CONTROL PANEL



CFO0801002_004

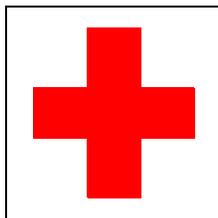
PLACARDS



**HALON FIRE
EXTINGUISHER**



**OXYGEN
CYLINDER**



FIRST AID KIT



CFO0801002_001

EICAS MESSAGES

The oxygen system messages are shown on the EICAS. Oxygen system messages and inhibits are listed below. A brief explanation of each message is provided.

MESSAGE	INHIBITS	MEANING	AURAL WARNING
OXYGEN QUANTITY LOW	TO/LAND	Oxygen is less than 700 liters	
OXYGEN VALVE CLOSED	TO/LAND	The oxygen bottle valve is closed or there is a miscompare in the number of bottles installed and the number of bottles selected on the Electro-Pneumatic Actuating Valve unit. This message will normally only occur on the ground	
PAX OXYGEN AUTO FAIL	TO/LAND	Passenger oxygen system has failed to deploy with the cabin altitude greater than 15 000 ft and the pax oxygen system in AUTO. Either the pax masks have not deployed or the pax oxygen system is not pressurized	
PAX OXYGEN OFF		The passenger oxygen switch has been selected OFF	
PAX OXYGEN ON		Pressure has been detected in the passenger oxygen lines.	