

A330-200
TECHNICAL TRAINING MANUAL
MECHANICS / ELECTRICS & AVIONICS COURSE
35 OXYGEN
GE Metric

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■ FQW4200

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OXYGEN SYSTEM PRESENTATION

General
Crew
Passenger
Portable

GENERAL

The oxygen system consists of three different subsystems :

- the crew oxygen system,
- the passenger oxygen system,
- and the portable oxygen system.

CREW

The flight crew oxygen system ensures the protection for four flight crew members in case of loss of cabin pressurization or of smoke or toxic gas emission.

PASSENGER

The passenger oxygen system uses high pressure oxygen, stored in oxygen cylinders in the FWD cargo compartment.

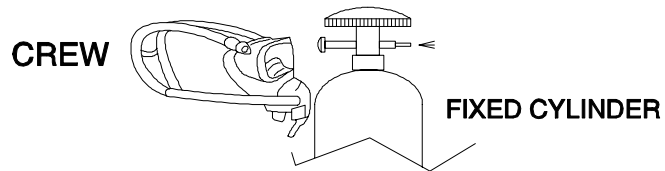
The duration of the oxygen supply depends on :

- the number of cylinders installed,
- the number of masks in use,
- the pressure in the cylinders,
- the altitude of the aircraft.

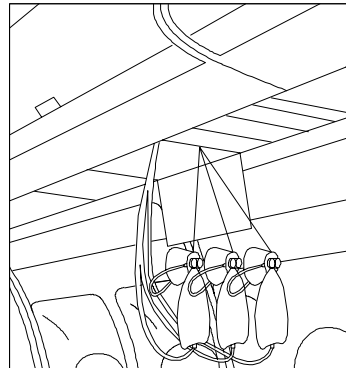
PORTABLE

The portable oxygen system is used by the cabin attendants in case of fire or emission of smoke or noxious gas. It permits them to move freely in the aircraft.

The flight crew emergency breathing hood system provides a protection for the eyes and breathing means for crew members. It permits a crew member to move freely to extinguish a fire.

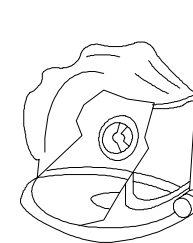


PASSENGERS

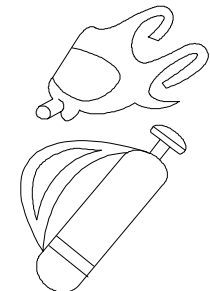


PASSENGERS
MASKS

PORTABLE



HOOD



PORTABLE CYLINDERS

STUDENT NOTES

CREW OXYGEN SYSTEM PRESENTATION

- General
- HP Supply
- Pressure Regulation
- Safety
- Control
- Distribution
- Test Port
- Fill Port

GENERAL

The system supplies oxygen to the flight crew if there is a loss of cabin pressurization, or a smoke emission.

It consists of a high pressure source and a low pressure distribution system.

The oxygen is supplied from a high pressure oxygen cylinder.

HP SUPPLY

The oxygen supply source is a composite or steel high pressure oxygen cylinder.

The cylinder is placed under a cover in a cradle and secured by quick disconnect metallic clamps designed to resist to 10 g crash loads.

Cylinder capacity :

- standard composite cylinder : 2183 l (77 ft3)
- optional composite cylinder : 3256 l (115 ft3)
- optional steel cylinder : 3256 l (115 ft3)

PRESSURE REGULATION

The pressure regulator transmitter is directly connected to the cylinder. Other connections to the rest of the system are flexible for easy cylinder removal.

The transmitter part sends HP indications to the ECAM.

Pressure is regulated at : 80 Psi,

maximum pressure : 174 Psi.

SAFETY

Overpressure in the HP source (frangible disc) or in the LP system (relief valve) is discharged overboard through a safety port.

Green disc ejected (yellow background visible) if :

HP press. > 2500 Psi

LP press. > 175 Psi.

CONTROL

Crew action on control panel 211 VU, activates a supply solenoid valve enabling downstream distribution.

Electrical supply to the solenoid valve is applied only for a fraction of a second corresponding to the operating time of the valve.

DISTRIBUTION

The distribution system consists of :

- an LP distribution manifold,
- a separate line for the captain,
- a set of lines for the other users,
- four mask stowage boxes,
- four full face quick donning masks.

Pressure switch set to : 50 Psi.

TEST PORT

A test port is used for performing distribution leakage tests.

Test maximum pressure : 145 Psi.

FILL PORT

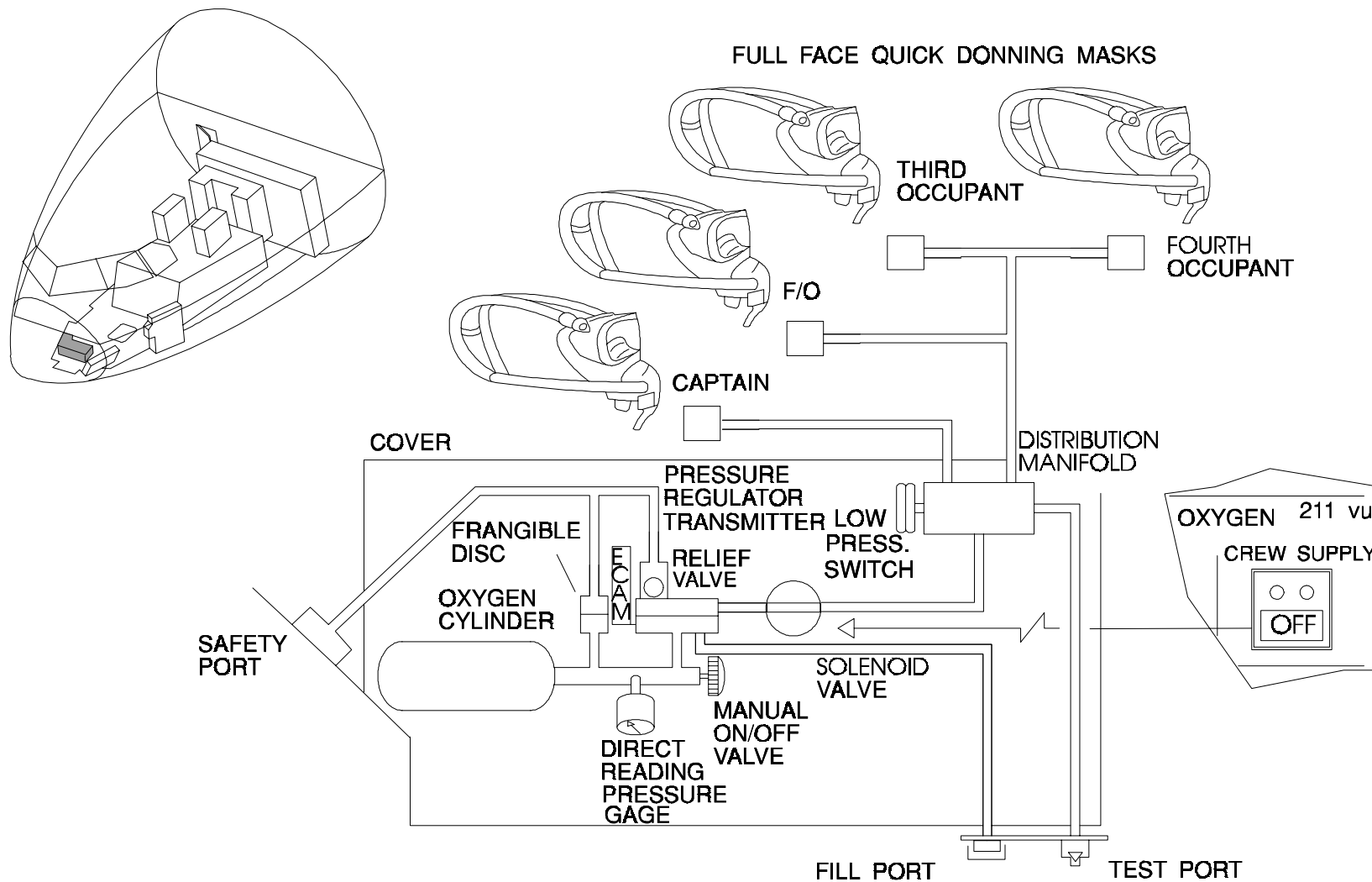
The filling system comprises :

- a fill port with filter & check valve,
- a flexible hose to connect the fill port to the the pressure regulator/transmitter.

The fill port enables cylinder filling without removal. Filling pressure is function of the outside and cockpit temperature.

Max. Fill Press. : 2025 Psi (140 bar)

Max Fill Flow : 500 l/mn.



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STUDENT NOTES;

SYSTEM CONTROL AND INDICATING

HP In Situ Visual Indication
Manual Isolation
HP Pressure Indication
LP Control
LP Warning

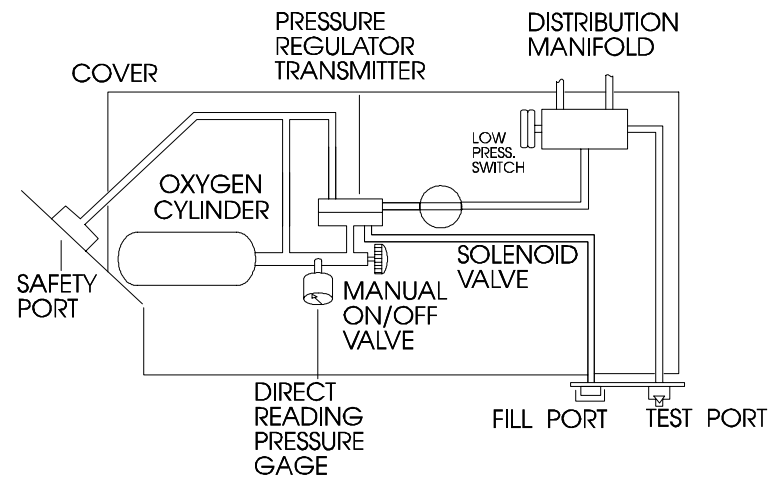
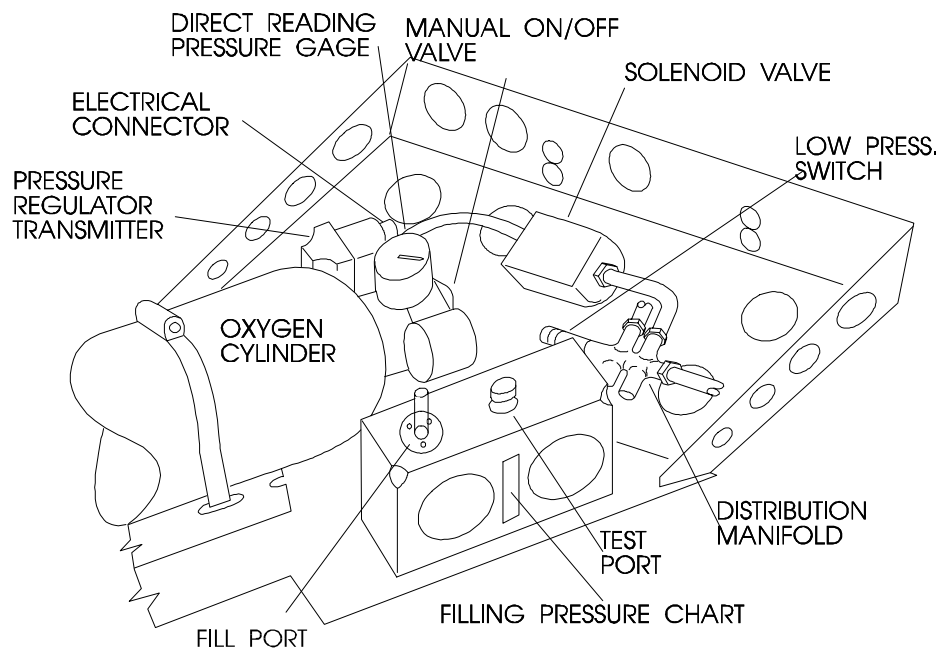
HP IN SITU VISUAL INDICATION

The direct reading pressure gage allows the cylinder pressure to be read at any time.

MANUAL ISOLATION

The manual ON/OFF valve isolates the cylinder.

The direct reading pressure gage indication is available whatever the position of the manual ON/OFF valve.



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HP PRESSURE INDICATION

The HP pressure indication appears on the ECAM DOOR/OXY page.
The pressure indication is provided by the pressure transmitter fitted on the pressure regulator transmitter.

CKPT OXY (white): normal condition.

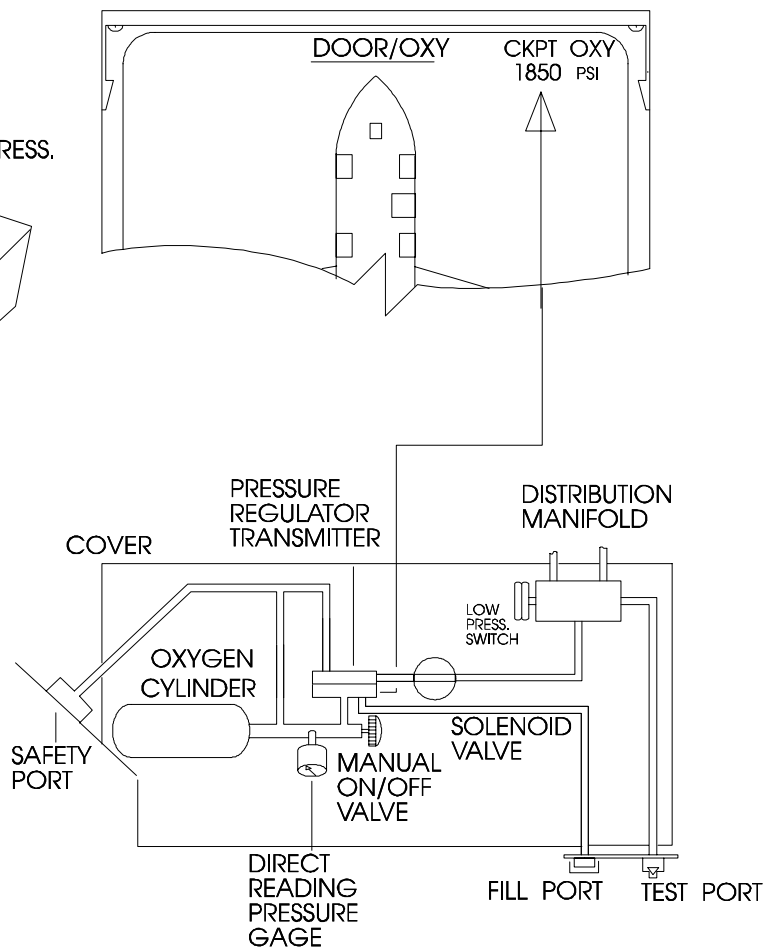
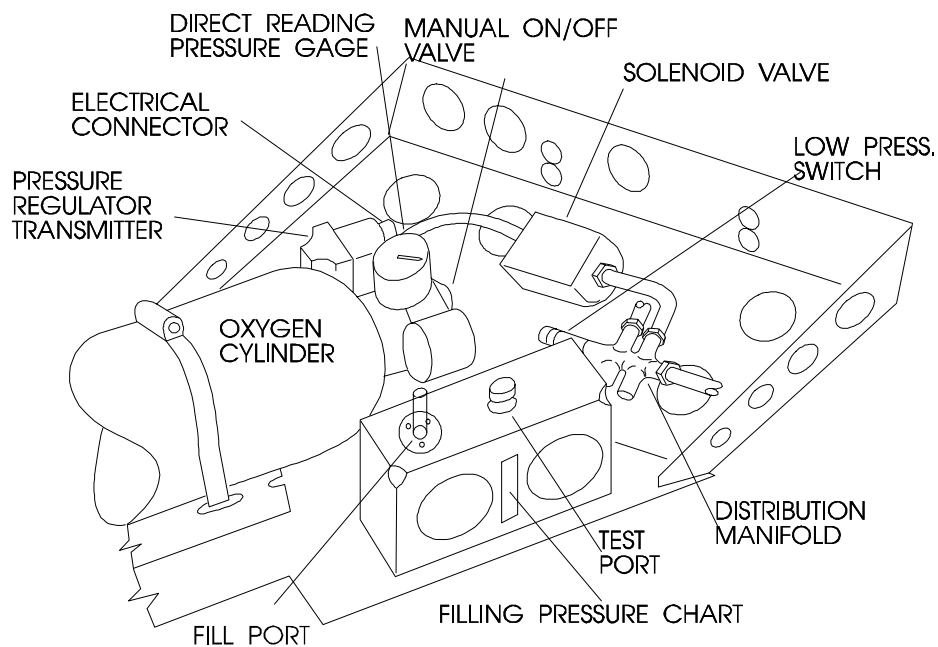
CKPT OXY (amber): when the HP pressure is lower than 400 Psi.

1850 (green): when the HP pressure is greater than 1500 Psi.

1499 (green value, amber underline): when the HP pressure is lower than 1500 Psi.

399 (amber): when the HP pressure is lower than 400 Psi.

xx (amber): when information is not available.

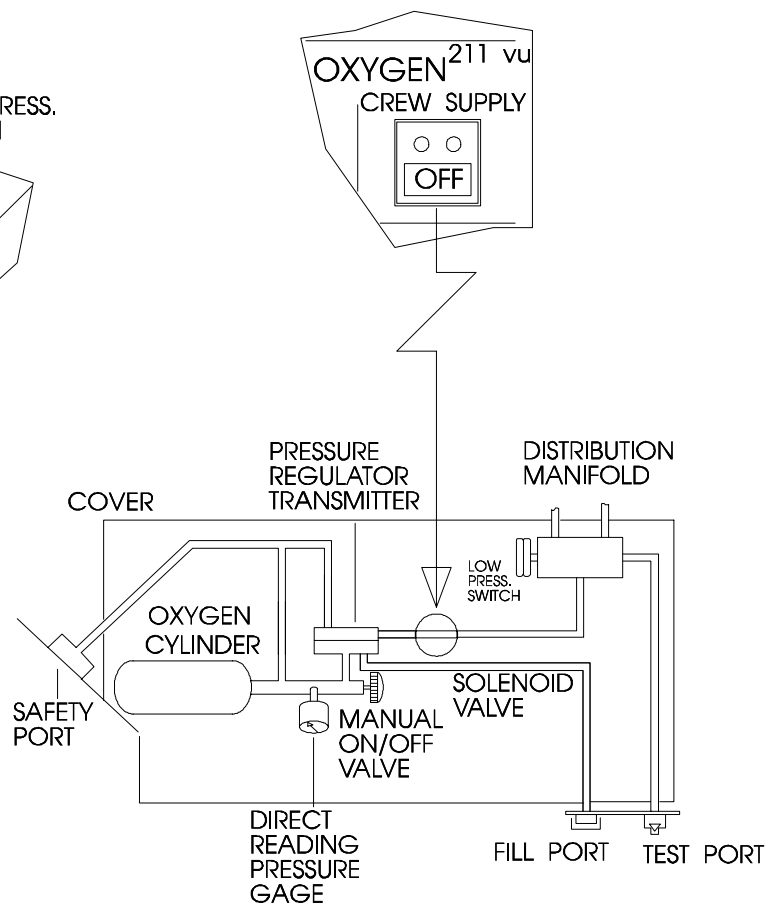
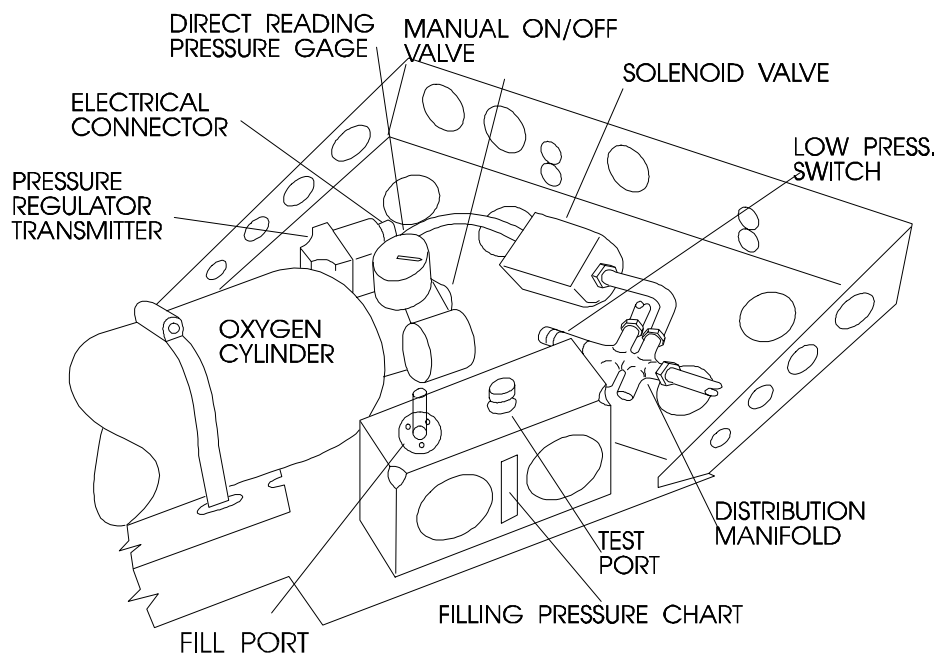


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LP CONTROL

The solenoid supply valve is supplied for a fraction of a second only. This corresponds to the valve operating time.

This valve should be used on ground only. It isolates the cylinder from the rest of the circuit.

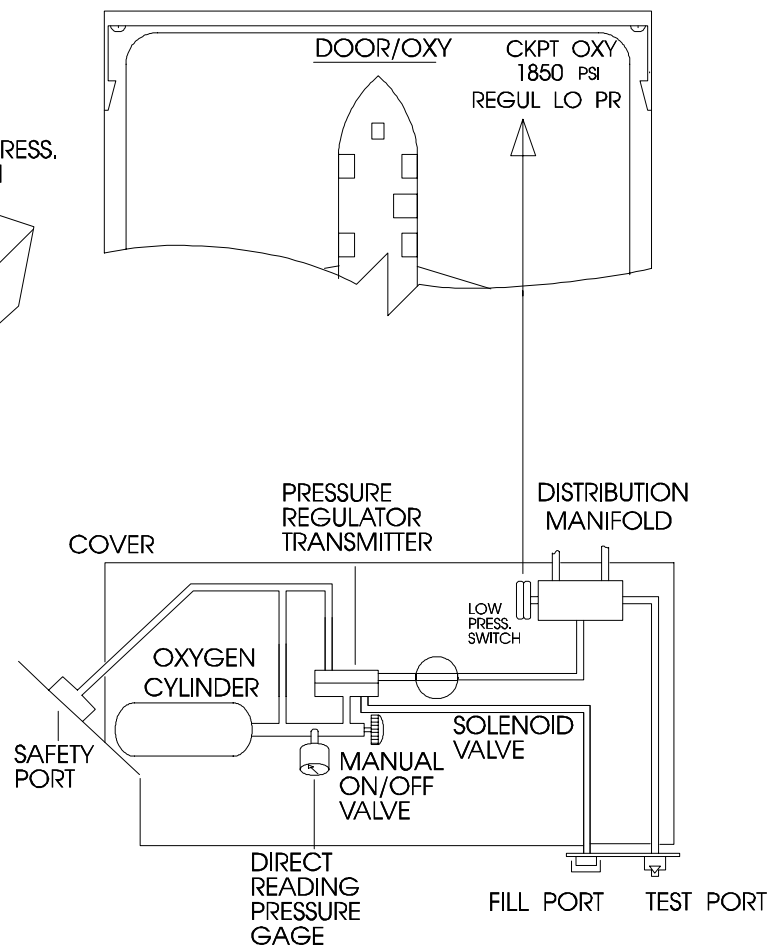
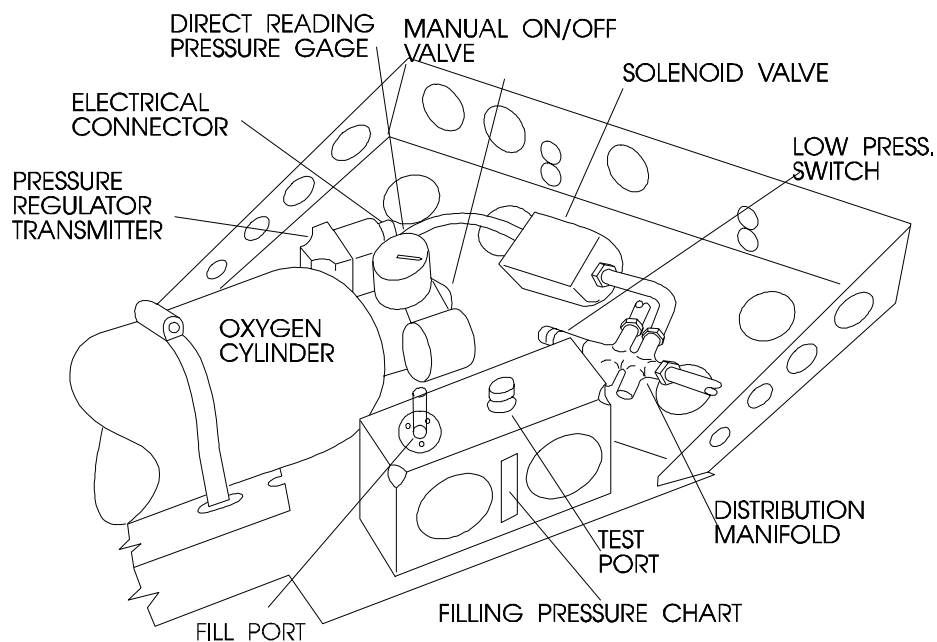


LP WARNING

The "REGUL LO PR" legend appears amber on the ECAM DOOR/OXY page when the LP pressure is lower than 50 psi. Otherwise nothing is displayed.

CKPT OXY (white): normal condition.

CKPT OXY (amber): when the LP pressure is lower than 50 Psi, or when the CREW OXYGEN SUPPLY pushbutton is OFF.



STUDENT NOTES:

CREW OXYGEN MASK PRESENTATION AND UTILIZATION

Presentation
Utilization

PRESENTATION

The stowage box which contains the mask, supplies oxygen to the mask when pulled out of the box.

The mask regulator provides either normal or pure oxygen on demand by means of a NORMAL/100 % selector .

In the normal position, the user breathes a mixture of cabin air and oxygen.

When the emergency rotation knob is rotated and the NORMAL/100% selector is in the 100 % position, the mask regulator provides pure oxygen at a permanent positive pressure.

UTILIZATION

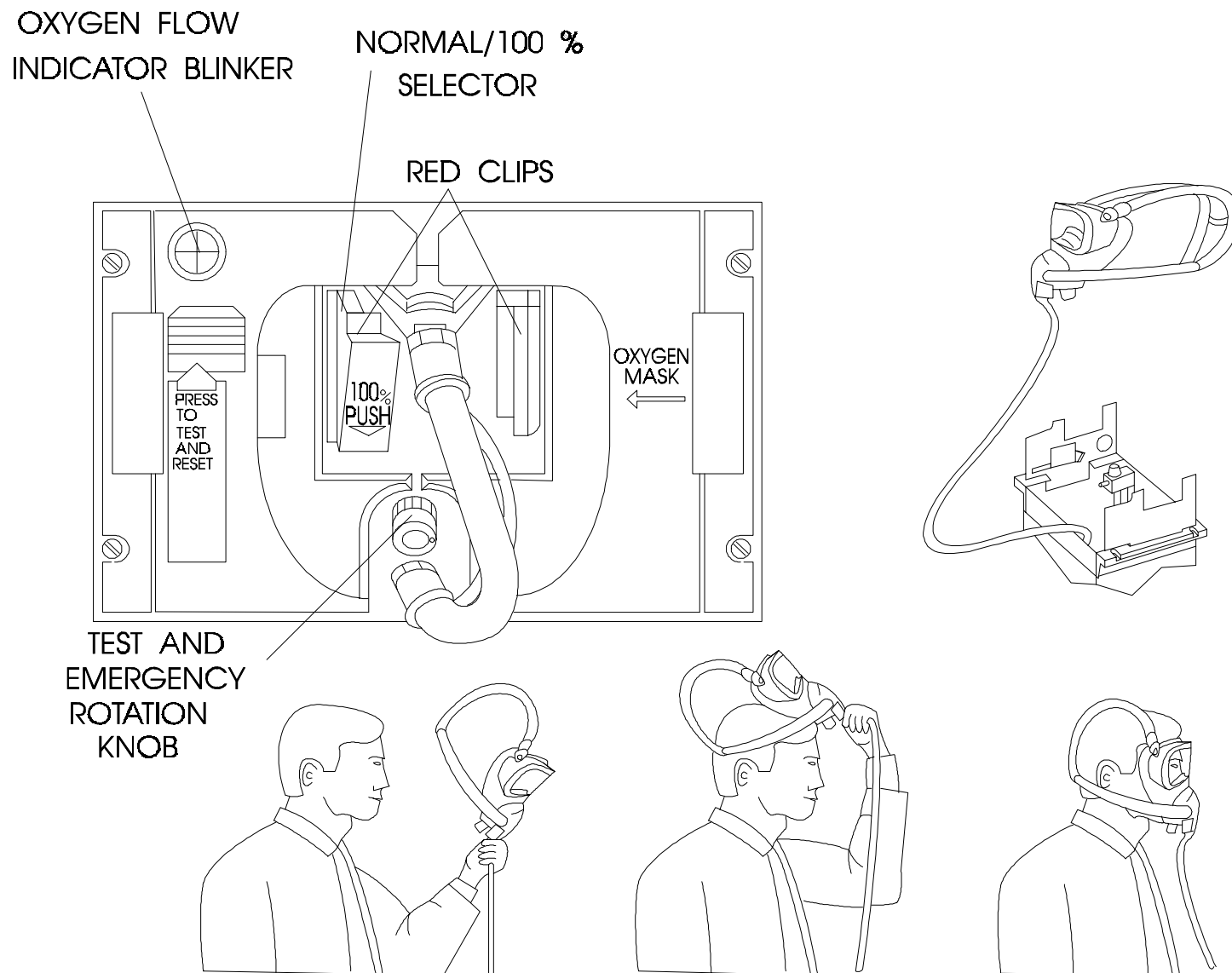
To use the mask, pull the mask out of the stowage box by using the red clips. Squeezing the red clips when the mask is out inflates the harness.

Adjust the mask on your head and release the red clips in order to deflate the harness to secure the mask on the head.

The blinker fitted on the stowage box is yellow or black, depending on oxygen supply to the mask.

To take the mask off, the harness has to be inflated. This is done by squeezing the red clips.

The test & reset button allows oxygen flow to the mask for in situ testing and resetting after restowing.



STUDENT NOTES:

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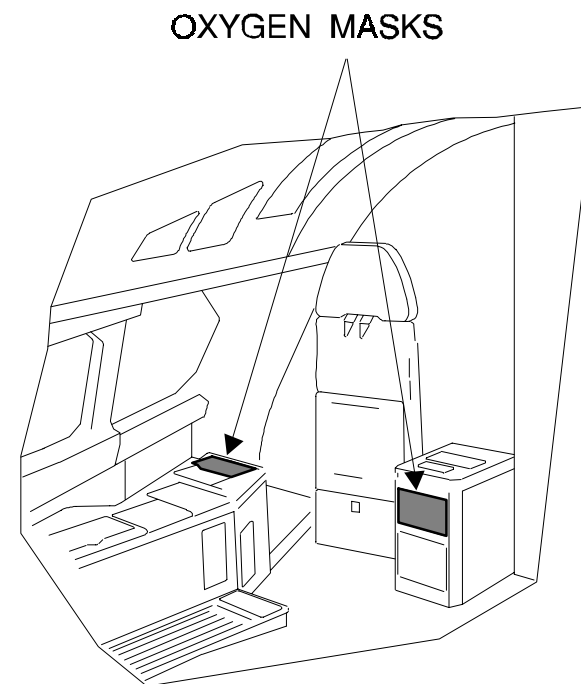
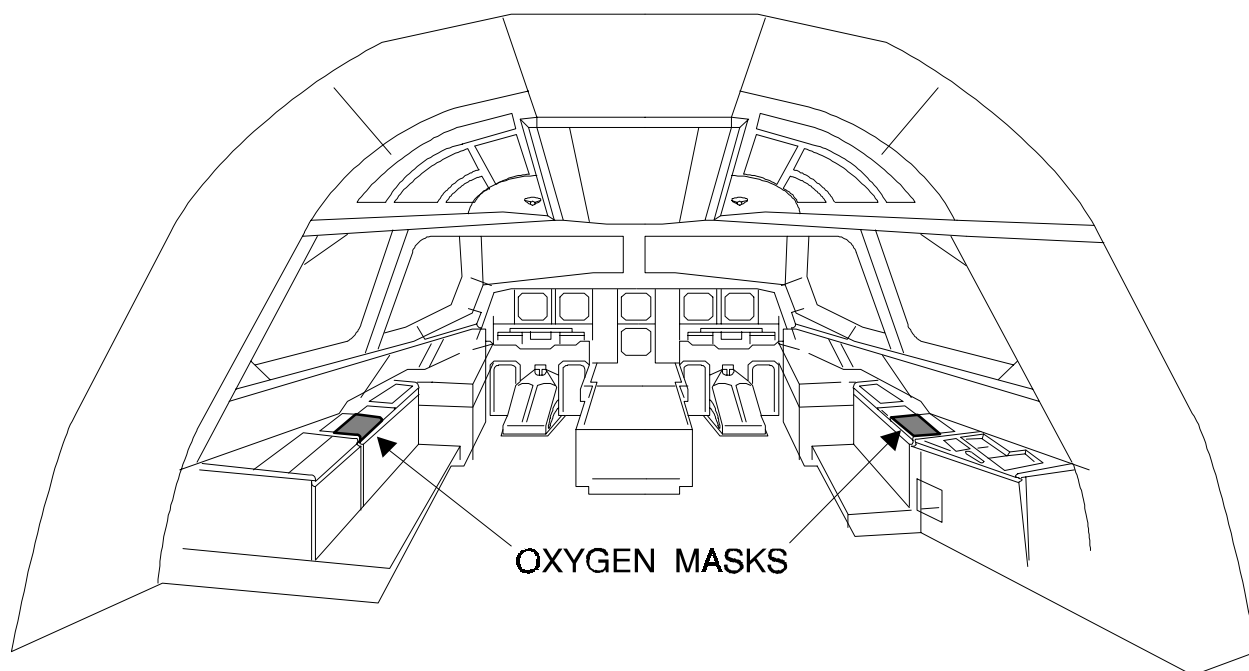
CREW OXYGEN MASKS DESCRIPTION AND OPERATION

Location
Stowage Box Description
Stowage Box Operation
Crew Masks
Regulator
Microphone

LOCATION

The crew mask stations are installed in the cockpit next to each flight crew position.

Each stowage box assembly contains one full-face quick donning mask.



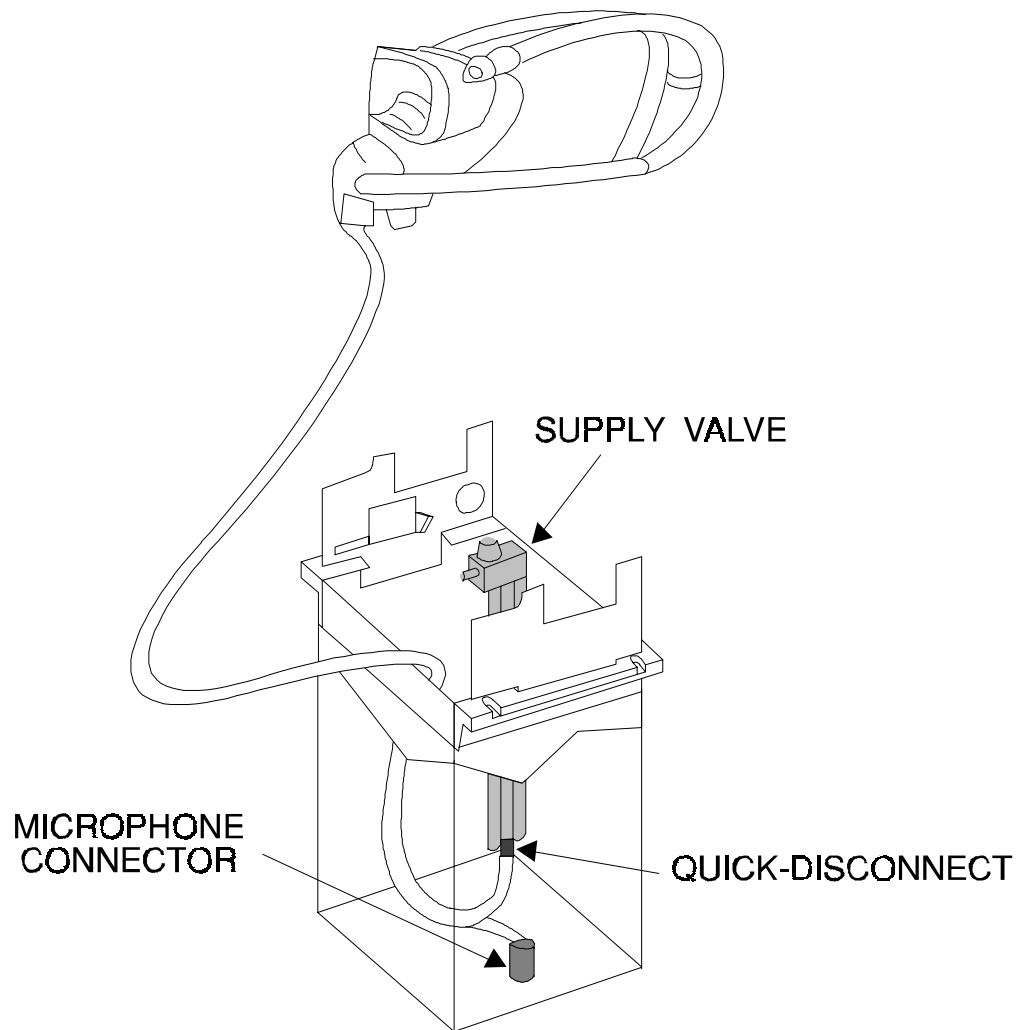
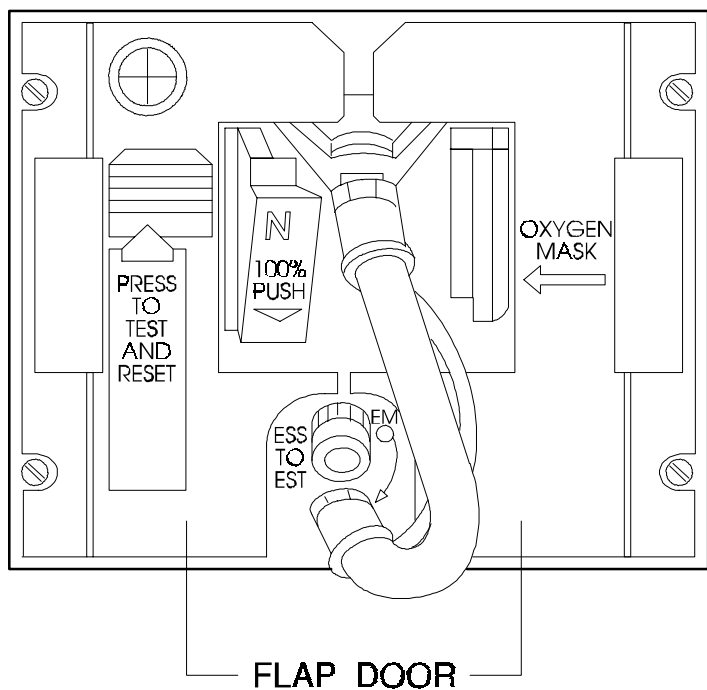
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STOWAGE BOX DESCRIPTION

Each stowage box is the connection point for the full-face quick donning mask which is kept in the box until required for use.

Each stowage box includes :

- a pneumatic supply valve,
- a two flap door,
- a quick-disconnect coupling to supply the mask,
- a microphone connector.



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STOWAGE BOX OPERATION

When the left flap door is closed, the piston valve shuts off the mask oxygen supply.

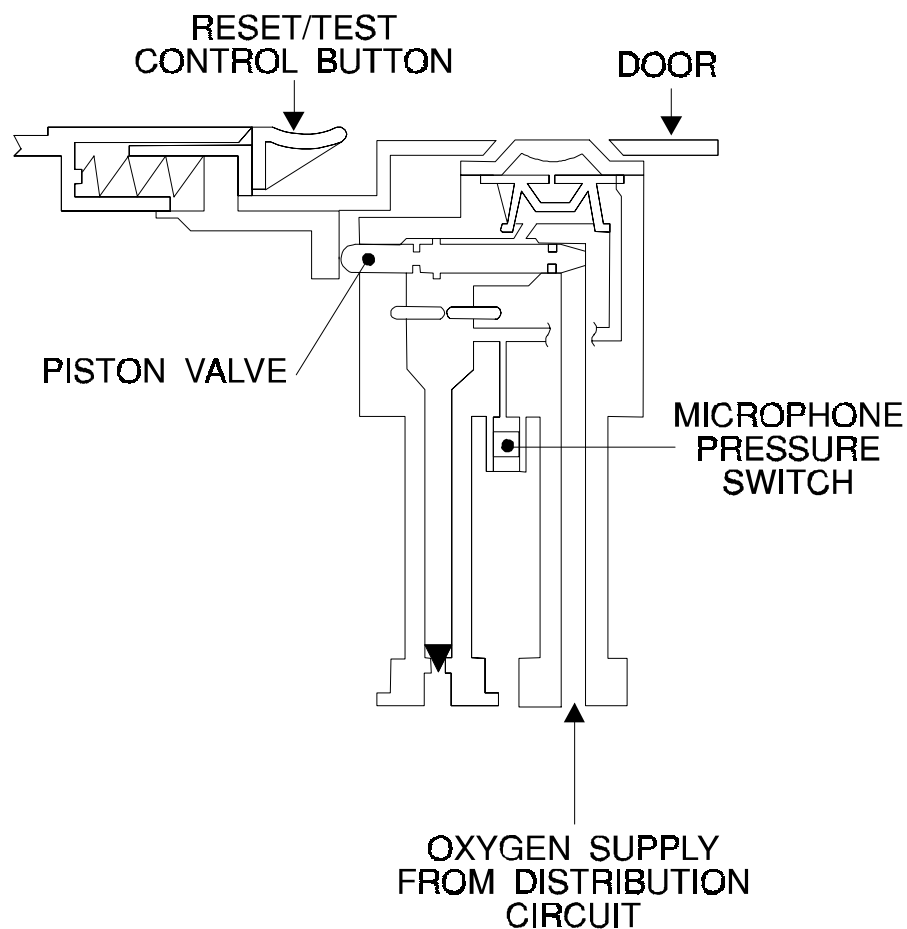
When the mask is pulled out for use, the opening of the left flap door releases the piston valve which opens under supply pressure.
Then, the first closing of the left flap door triggers the OXYGEN ON flag.

When the mask is in use, the flow indicator blinker operates under the differential pressure created by the restrictor.

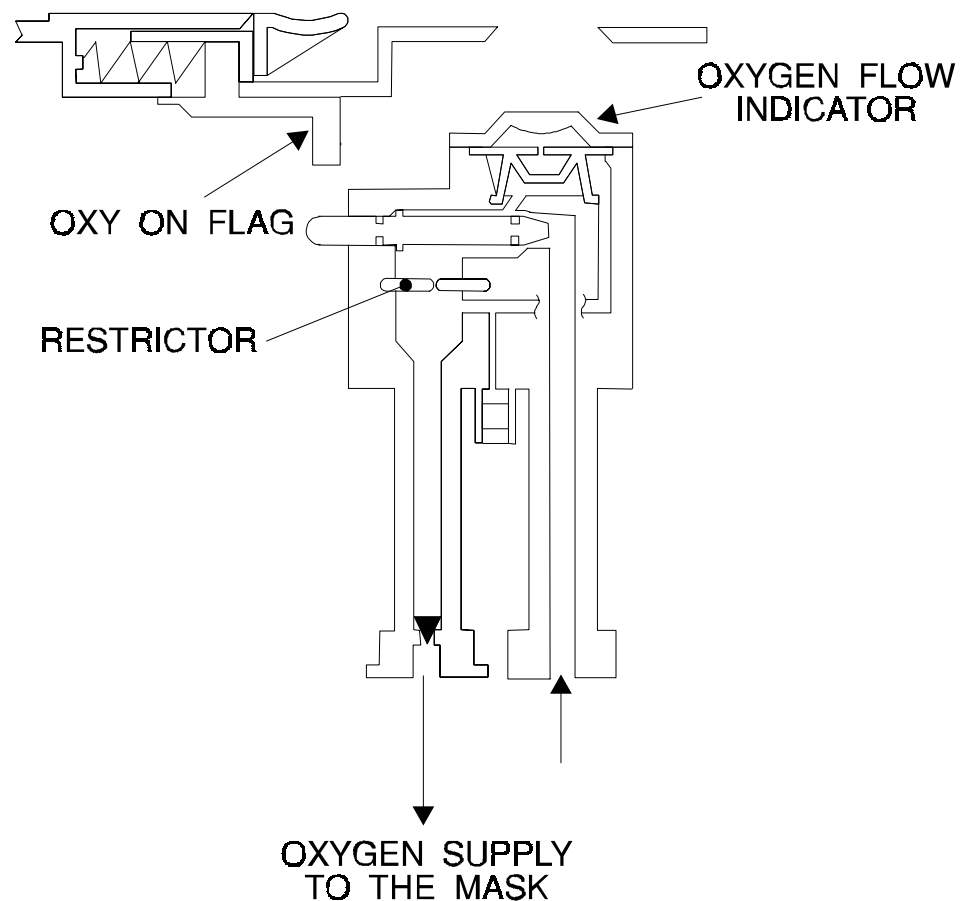
After restowing the mask and closing the two flap door, the test and reset button must be pushed, then the OXYGEN ON flag disappears.

For test purposes, the test and reset button, when pressed in, releases the piston valve and permits the mask in situ test to be performed.

FLAP DOOR CLOSED



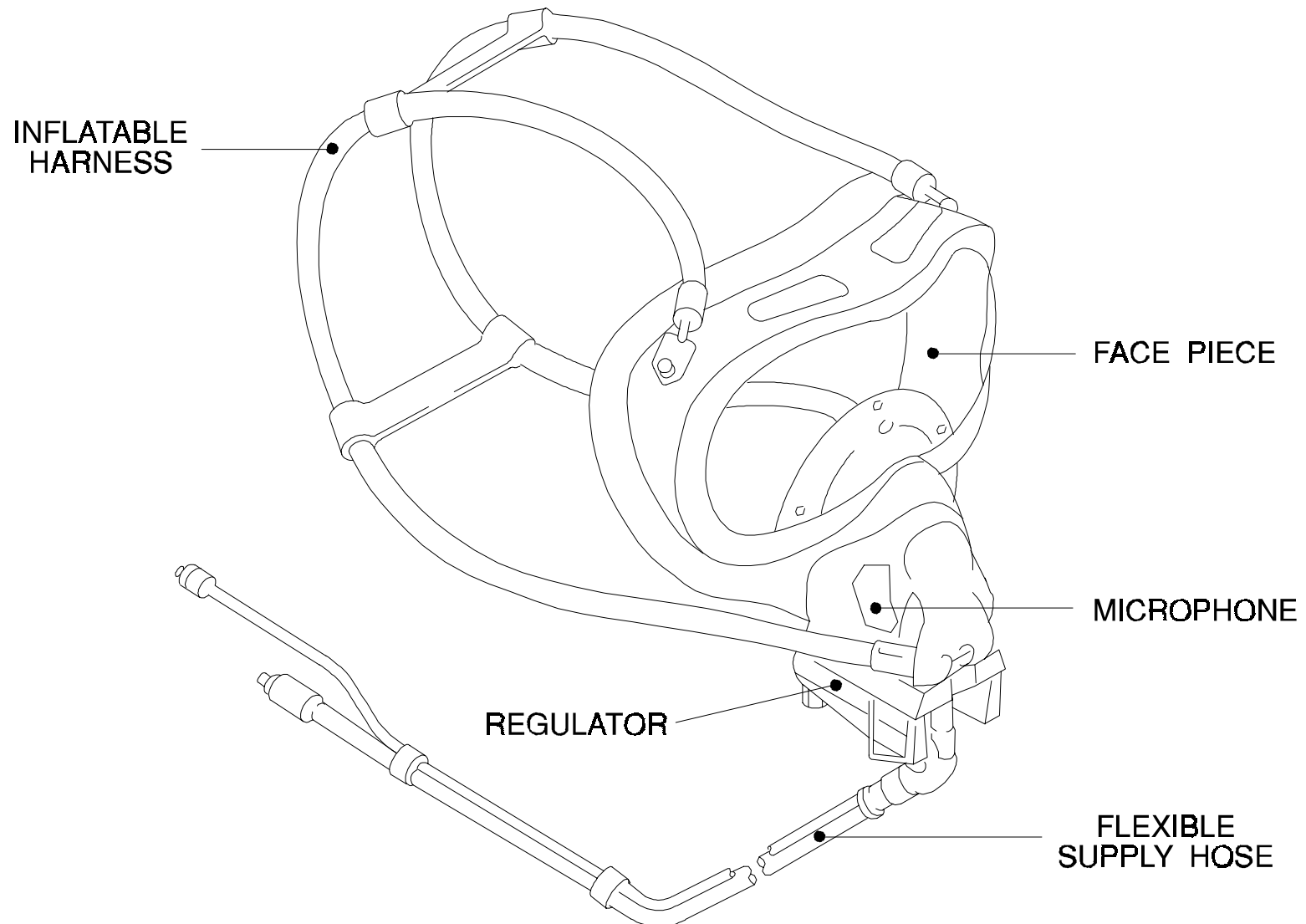
FLAP DOOR OPEN AND MASK NOT IN USE



CREW MASKS

The mask is connected to the stowage box via a flexible supply hose and a microphone cable fitted with a quick disconnect.

The mask face piece is fitted with a microphone and an inflatable harness which maintains the mask tightly against the user's face.



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REGULATOR

The regulator is fitted on the mask and controls the air/oxygen flow.

The regulator performs the following functions :

- air and oxygen dilution,
- 100% oxygen supply without overpressure,
- automatic overpressure,
- emergency function,
- regulator functional test,
- harness inflation control.

When the NORMAL/100% selector is in the NORMAL position, user breathes a mixture of cabin air and oxygen on demand.

The regulator comprises 2 aneroid capsules to perform :

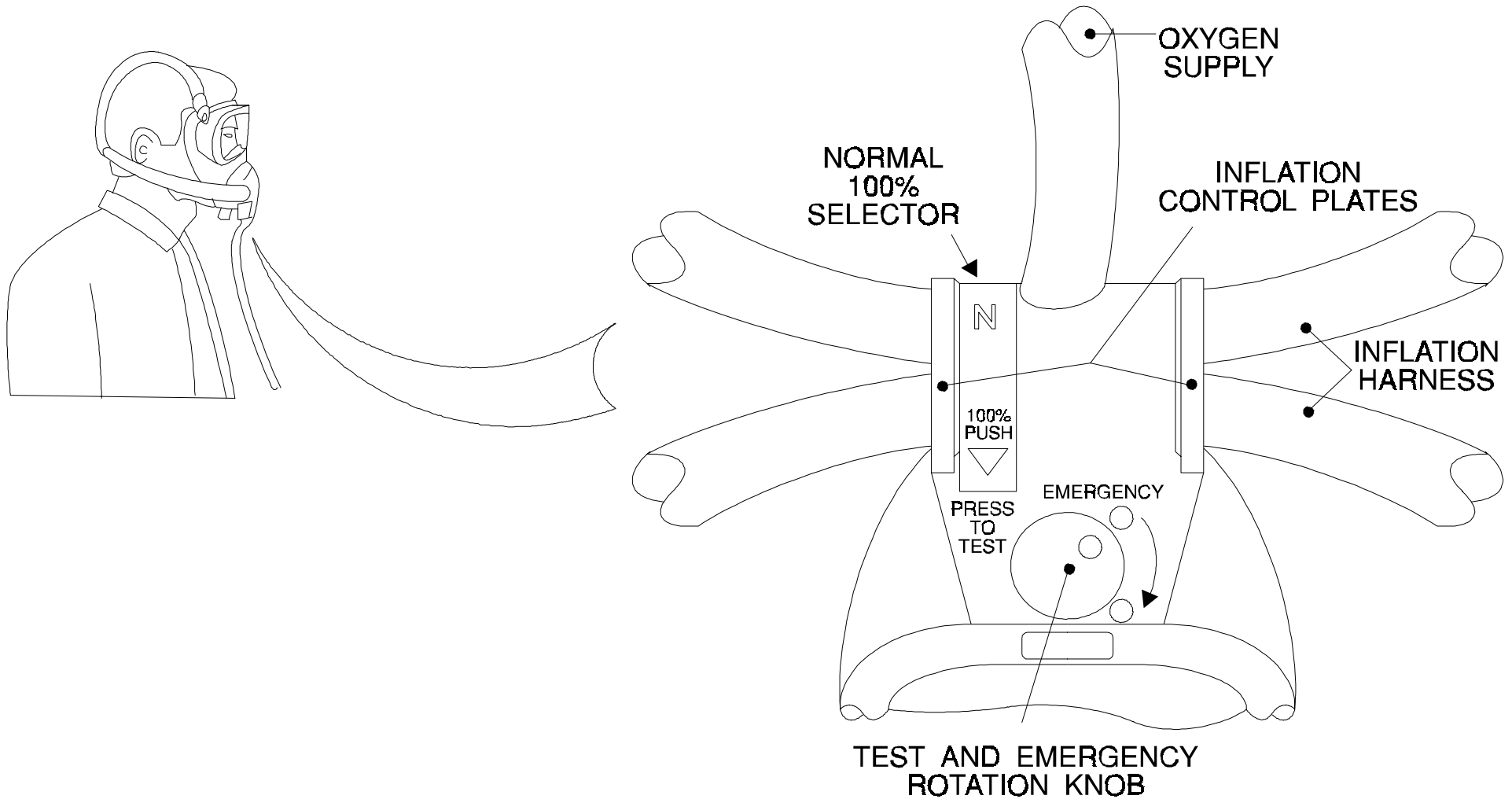
- automatic overpressure above 30,000 ft cabin altitude,
- mixing of cabin air and oxygen regulated up to 35,000 ft, above : oxygen only.

When the NORMAL/100% selector is set to 100%, the user breathes pure oxygen at all cabin altitudes.

The regulator can be tested by pressing the TEST AND EMERGENCY knob.

When the TEST/EMERGENCY knob is turned to the EMERGENCY position, continuous oxygen overpressure is supplied to the mask.

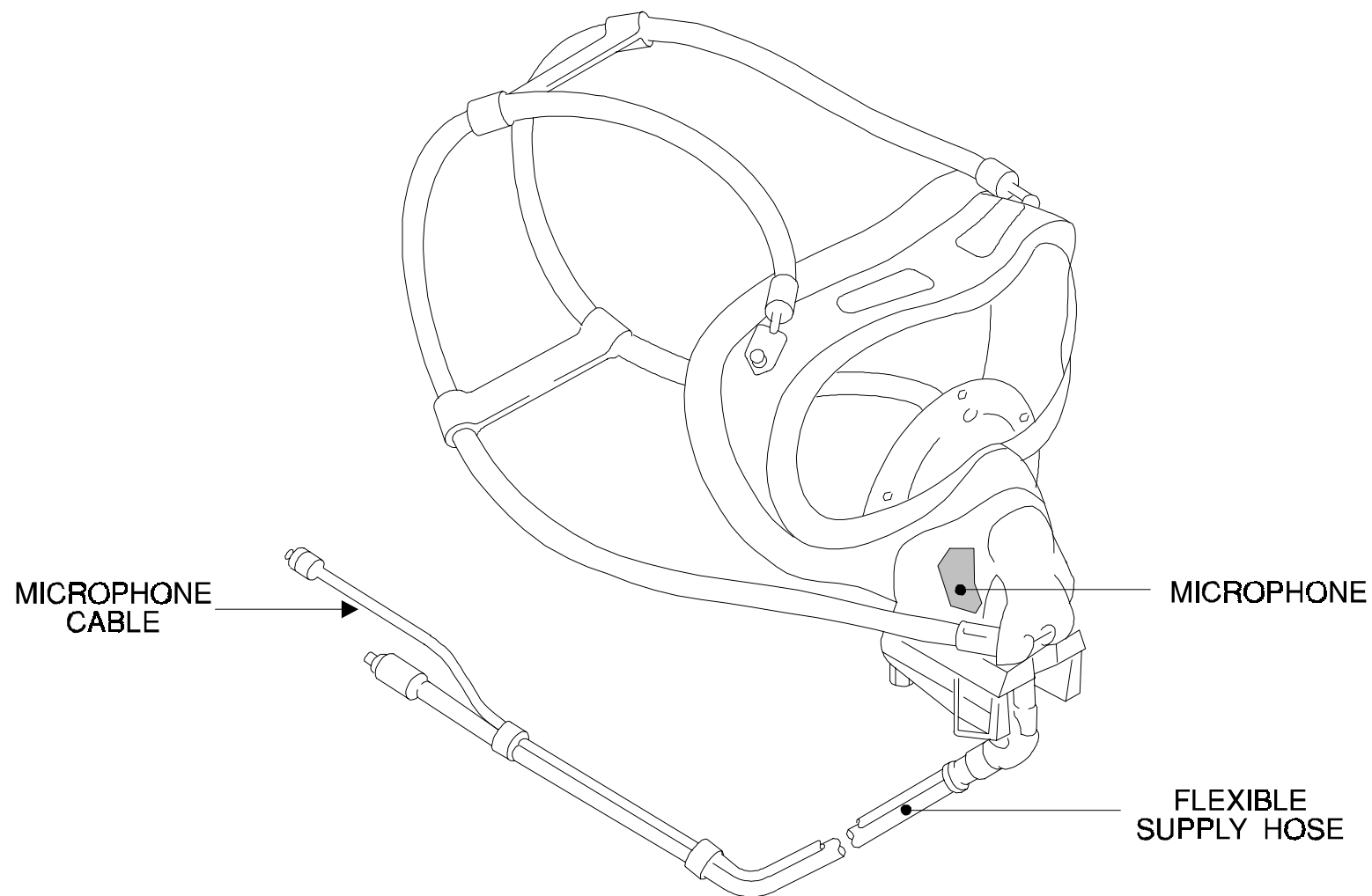
The inflatable harness is inflated when the inflation control plates are squeezed.



MICROPHONE

The microphone allows radio communications when the mask is used.

The pressure switch, fitted on the stowage box supply valve, enables the operation of the microphone only when the mask is supplied by oxygen pressure.



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STUDENT NOTES:

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CREW OXYGEN MASK TEST

Preparation
Test Procedure
Close-Up

PREPARATION

1. Get access to the cockpit by means of access door 811.
2. Energize the Aircraft Electrical Circuits from the external power A.
3. Push the OXYGEN/CREW SUPPLY pushbutton.
4. Do the E.I.S. start procedure.
5. Make sure that the pressure value in the oxygen cylinder(s) is correct.

WARNING:

- Keep all hydrocarbons (fuels, lubricants, etc.) away from all sources of oxygen. Oxygen becomes explosive when it touches hydrocarbons.
- Clean the tools and make sure your hands are clean to prevent contamination of the oxygen system.

TEST PROCEDURE

The operational test of the crew oxygen mask has to be performed on all the masks. To do the test, perform the following actions:

- Push the PRESS TO TEST AND RESET control button. (Hold this button pressed during the test.)

The flow rate indicator comes into view for a short time. This indicates that the regulator is leak tight.

An oxygen flow must also be heard.

- Push and release the harness inflation control lever.

The flow rate indicator comes into view and goes out very slowly.

This indicates that the harness is leak tight.

An oxygen flow must also be heard.

- Push the test and emergency rotation knob for 1 second.

The flow rate indicator comes into view when the test and emergency rotation knob is pushed. This indicates that the emergency system is correctly working.

An oxygen flow must also be heard.

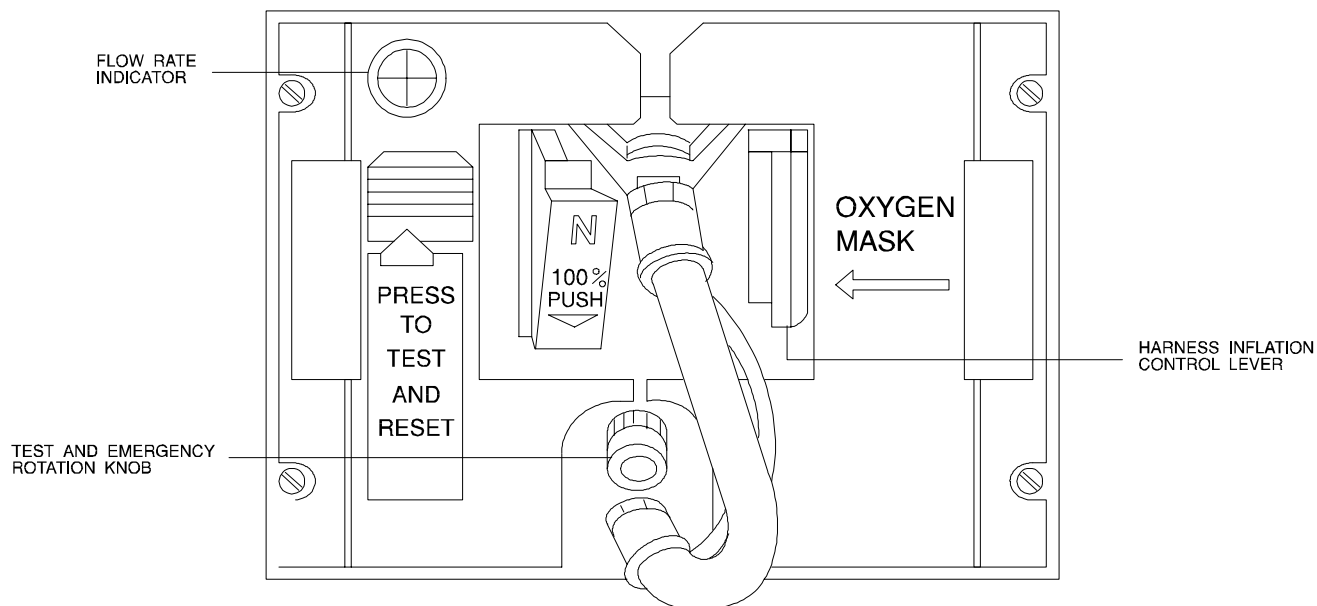
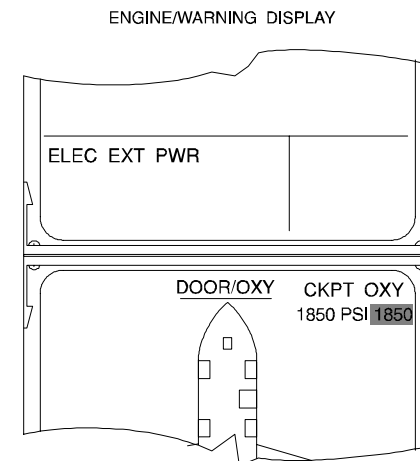
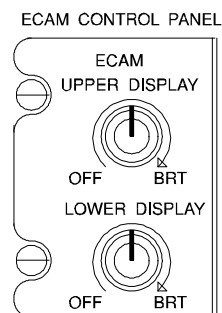
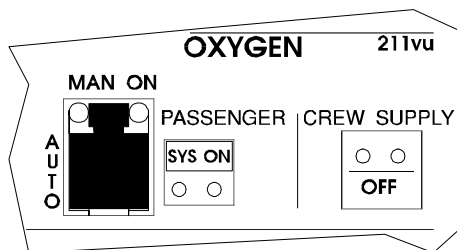
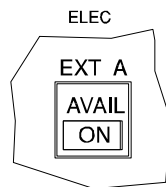
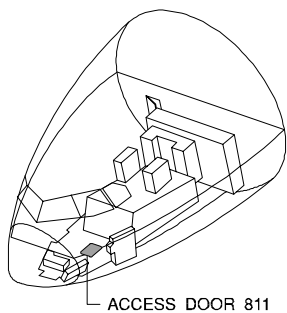
- Operate now the NORMAL / 100% control.

By operating and locking this control in the 100% position, you check if the control correctly operates and locks. Finally, put the control in the 100% position.

CLOSE-UP

Put the aircraft now back to its initial configuration:

- Release the OXYGEN/CREW supply pushbutton switch (OFF legend comes on).
- Make sure that the pressure value in the oxygen cylinder(s) is correct.
- Set the upper and lower potentiometers on the ECAM Control Panel to OFF.
- De-energize the aircraft electrical circuits and close access door 811.



OPTIONAL

STUDENT NOTES:

CREW OXYGEN COMPONENTS

- Safety Precautions
- Cylinder Valve Assembly
- Pressure Regulator/Transmitter
- Safety Port
- Fill Port
- Solenoid Valve
- Low Pressure Switch
- Full Face Quick Donning Mask
- Test Port

SAFETY PRECAUTIONS

WARNING :

Keep all hydrocarbons (fuels, lubricants, etc.) away from oxygen sources.

OXYGEN BECOMES EXPLOSIVE when it comes in contact with HYDROCARBONS.

Clean the tools and make sure your hands are clean to prevent contamination of the oxygen system.

CAUTION :

Put dry and clean, metal or plastic plugs on all pipes or units removed temporarily.

Put each pipe or unit in a sealed vinyl bag.

STUDENT NOTES

CYLINDER VALVE ASSEMBLY

FIN : 5750HT
5751HT (optional)

ZONE : 122

COMPONENT DESCRIPTION

The cylinder valve assembly includes :

- A manual slow opening valve,
- A direct reading pressure gage connected upstream of the manual valve,
- A high pressure safety outlet fitted with a frangible disk.

SPECIAL DESIGN

The closed position of the manual slow opening valve is used during the replacement of the cylinder.

PRESSURE REGULATOR/TRANSMITTER

FIN : 1HT
5HT (optional)

ZONE : 122

COMPONENT DESCRIPTION

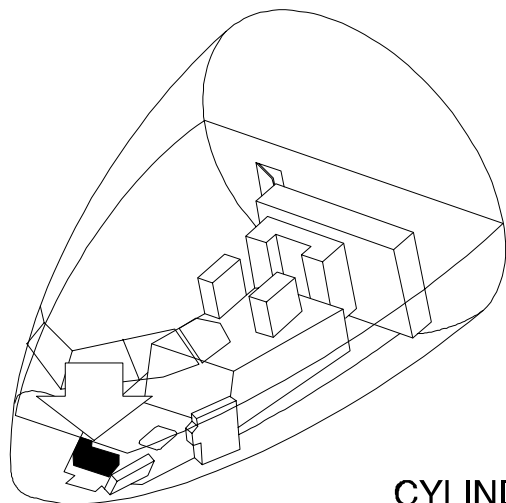
The oxygen pressure regulator/transmitter is screwed to the outlet connection of the cylinder valve assembly.

REGULATOR SECTION

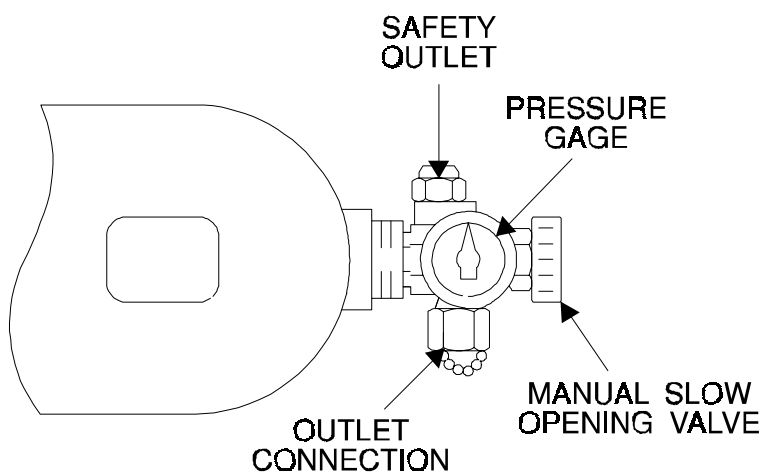
- Reduces the High Pressure (1850 Psi) delivered by the oxygen source into a Low Pressure (80 Psi) compatible with the distribution equipment.
- Ensures the proper pressure of the LP circuit up to 175 Psi.

TRANSMITTER SECTION

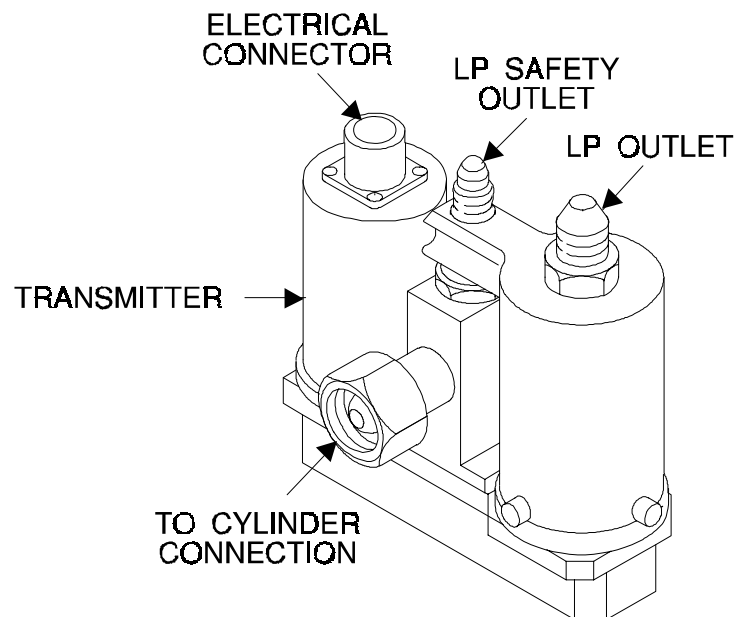
- Generates an electrical signal, proportional to the cylinder pressure, sent to the SDACs (for ECAM information and warnings).



CYLINDER VALVE ASSEMBLY



PRESSURE REGULATOR TRANSMITTER



SAFETY PORT

FIN : 5756HT

ZONE : 122

COMPONENT DESCRIPTION

The green disc will be blown out under an oxygen pressure of 40 to 100 Psi, then show a yellow indicator.

FILL PORT

FIN : 5769HT

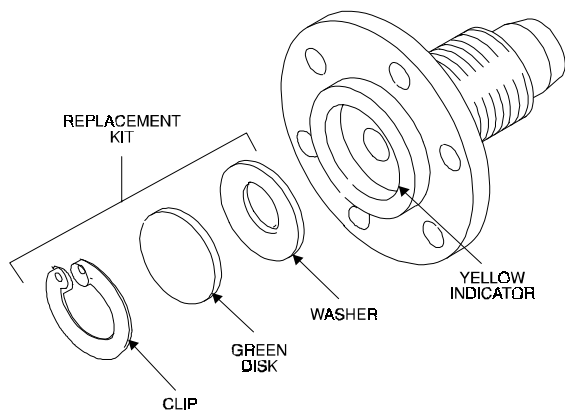
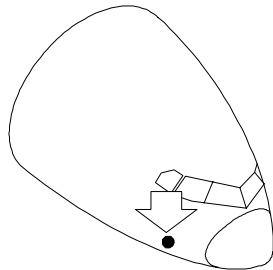
ZONE : 122

COMPONENT DESCRIPTION

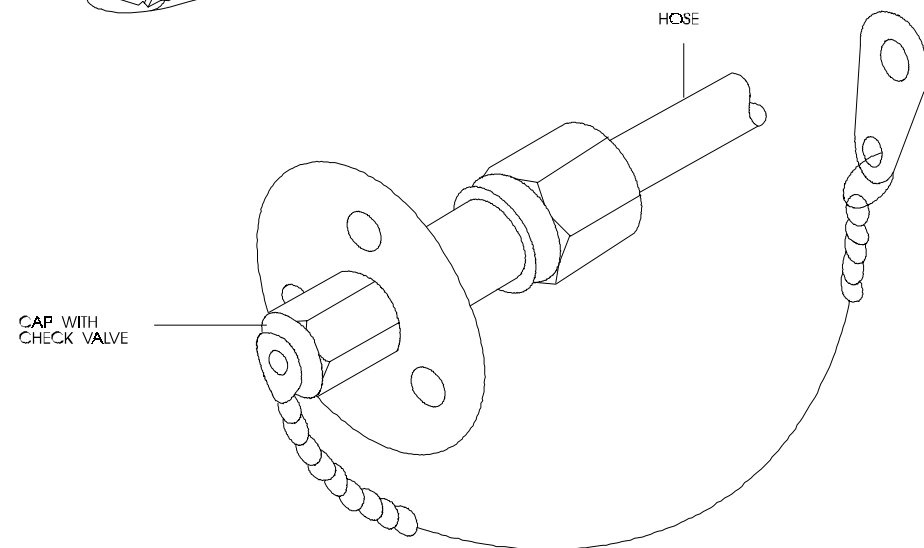
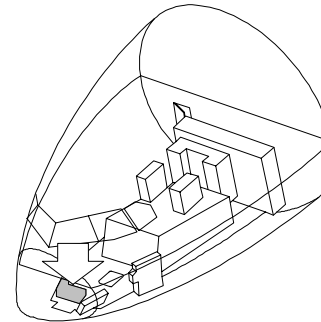
The filling system allows replenishment of the oxygen source without removal of the cylinder. The filling port consists of a:

- fill port (consists of a filter and is protected by a cap with a check valve)
- flexible hose (connects fill port to regulator/transmitter)

SAFETY PORT



FILL PORT



SOLENOID VALVE

FIN : 2HT

ZONE : 122

COMPONENT DESCRIPTION

The Low Pressure oxygen supply solenoid valve is controlled by a 28 VDC electrical signal.

The valve has an integrated electronic circuit which transforms the Direct Current into a pulse which operates the valve.

SPECIAL DESIGN

The solenoid valve stays in the last selected position if there is no new control signal.

LOW PRESSURE SWITCH

FIN : 6WV

ZONE : 122

COMPONENT DESCRIPTION

The oxygen pressure switch, installed on the distribution manifold, sends an electrical signal to both SDACs in case of abnormal Low Pressure (lower than 50 Psi).

FULL FACE QUICK DONNING MASKS

CKPT

FIN : 8RN1

ZONE : 211

F/O

FIN : 8RN2

ZONE : 212

3RD OCCPNT

FIN : 8RN3

ZONE : 211

4TH OCCPNT

FIN : 8RN4

ZONE : 212

TEST PORT

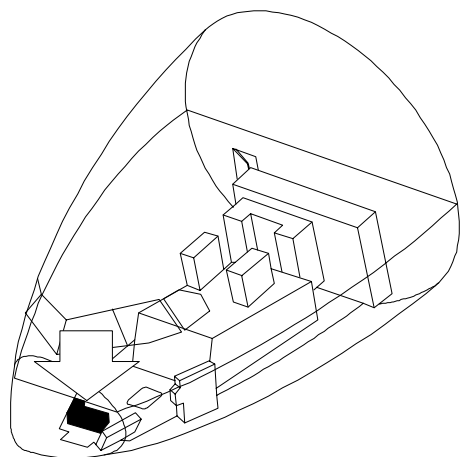
FIN : 5755HT

ZONE : 122

COMPONENT DESCRIPTION

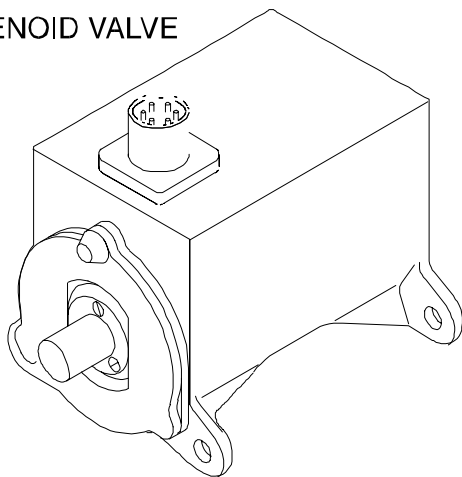
The test port is composed of :

- a body allowing the connection for testing,
- an internal filter,
- an internal self sealing valve,
- a cap (attached with a small chain) to protect the inlet.

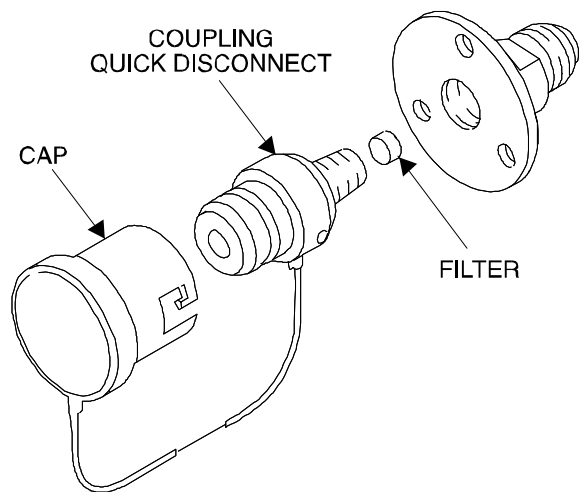
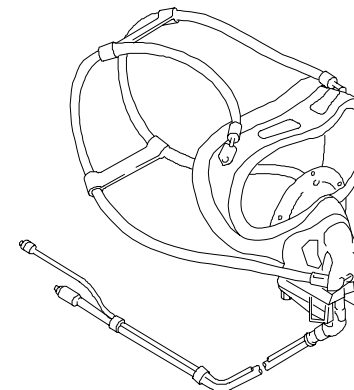


TEST PORT

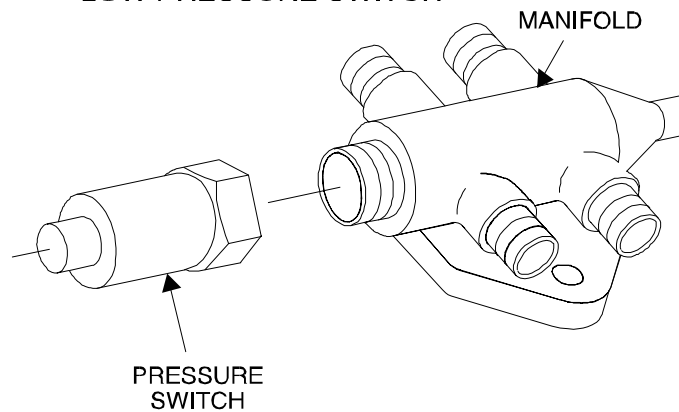
SOLENOID VALVE



FULL FACE QUICK DONNING MASKS



LOW PRESSURE SWITCH



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STUDENT NOTES

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OXYGEN CYLINDER REFILLING - ONE BOTTLE

Warnings
Set-Up
Filling Procedure
Test

WARNINGS

Before starting the refilling procedure of the crew oxygen cylinder, obey these special precautions:

- Prevent all maintenance procedures on the aircraft (refueling, repair of fuel and hydraulic systems, use of flammable materials (cleaning, de-icing, etc...), connection/disconnection of the ground power connector).
- Make sure there is no smoking or flame in a radius of 20m. (66ft.) of the replenishing equipment.
- Use only the equipment which is especially adapted for the oxygen system.
- Clean the tools and make sure your hands are clean to prevent contamination of the oxygen system.
- Carefully obey the replenishing instructions given on the aircraft placards.

SET-UP

Make sure that the overboard discharge indicator shows green

In the avionics compartment, make sure that the date of the test given on the cylinder is in the permitted time limit.

Also make sure that the oxygen line end-fittings and the electrical connectors are in correct condition.

Put a warning notice in the work area to tell persons that the oxygen filling operation is dangerous.

Connect an electrostatic ground between the A/C and the filling assembly. Open, safety and tag circuit breaker 4HT.

FILLING PROCEDURE

Connect the filling assembly to the filling port. Then, measure the outside temperature and the cockpit temperature with a thermometer.

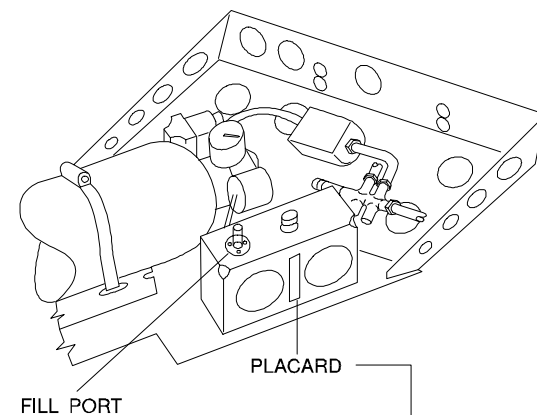
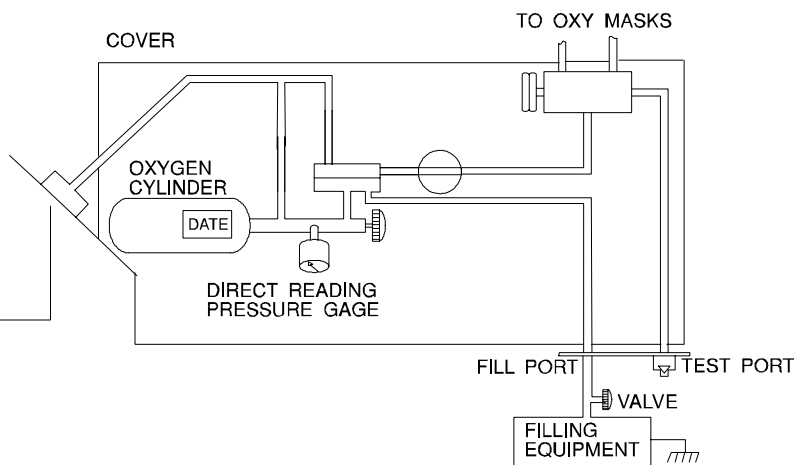
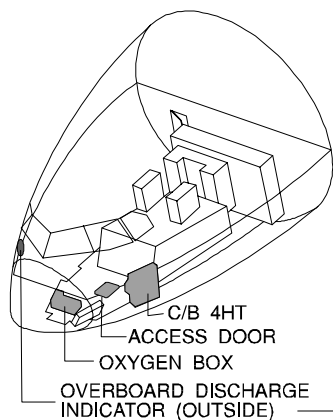
Find the filling pressure using the placard. Slowly open the valve of the filling equipment to pressurize the system. Close the valve when the direct reading pressure gage on the cylinder shows the correct filling pressure.

TEST

Before testing, the safety clip and tag must be removed and the circuit breaker 4HT must be closed.

Test: make sure that the pressure value shown on the pressure gage on the cylinder is the same as the pressure indication on the DOOR/OXY page of the SD.

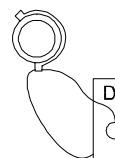
After you have checked the oxygen pressure on the DOOR/OXY page, don't forget to put the aircraft back to its initial configuration and to close the access.



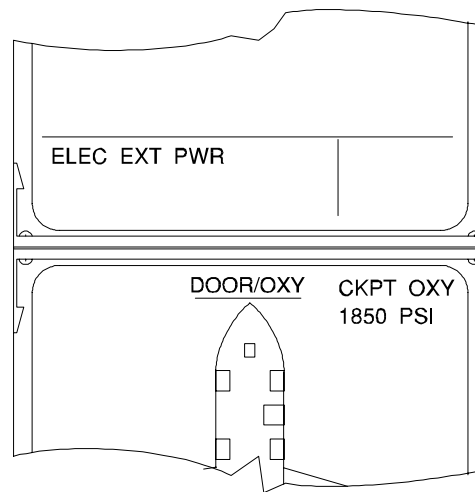
WARNING NOTICE



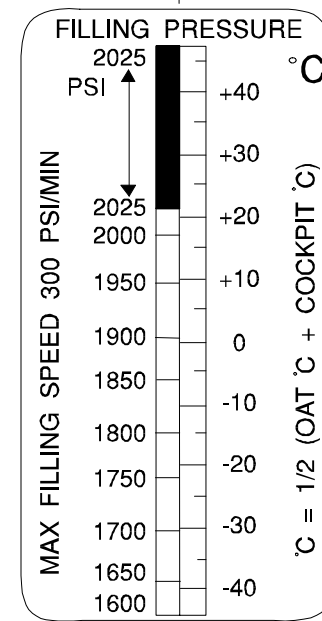
C/B 4HT



DO NOT REMOVE
Name: Joop Schneider
Reason: Oxygen filling procedure



SYSTEM DISPLAY



STUDENT NOTES:

FQW4200 GE Metric

OXYGEN CYLINDER REFILLING - TWO BOTTLES

Warnings
Set-Up
Filling Procedure
Test

WARNINGS

Before starting the refilling procedure of the crew oxygen cylinders, obey these special precautions:

- Prevent all maintenance procedures on the aircraft (refueling, repair of fuel and hydraulic systems, use of flammable materials (cleaning, de-icing, etc...), connection/disconnection of the ground power connector).
- Make sure there is no smoking or flame in a radius of 20m. (66ft.) of the replenishing equipment.
- Use only the equipment which is especially adapted for the oxygen system.
- Clean the tools and make sure your hands are clean to prevent contamination of the oxygen system and the ground servicing equipment.
- Carefully obey the replenishing instructions given on the aircraft placards.

SET-UP

Energize the aircraft electrical circuits and do the EIS start procedure.

Make sure that the overboard discharge indicator shows green.

In the avionics compartment, make sure that the date of the test given on the cylinders is in the permitted time limit.

Also make sure that the oxygen line end-fittings and the electrical connectors are in correct condition.

Put a warning notice in the work area to tell persons that the oxygen filling operation is dangerous.

Electrically ground the aircraft oxygen ground filling equipment and connect an electrostatic ground between the A/C and the filling assembly.

Open, safety and tag circuit breaker 4HT.

FILLING PROCEDURE

Connect the filling assembly to one of the filling ports. Then, measure the outside temperature and the cockpit temperature with a thermometer.

Find the filling pressure using the placard. Slowly open the valve of the filling equipment to pressurize the system. Close the valve when the direct reading pressure gage on the cylinder shows the correct filling pressure.

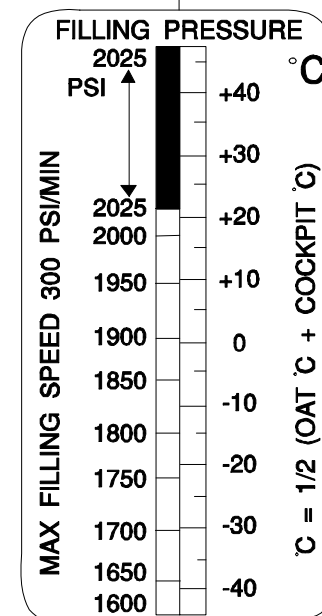
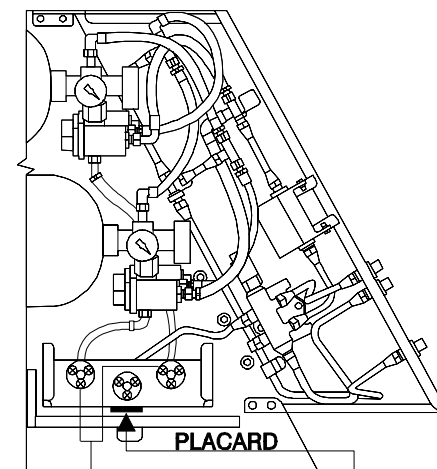
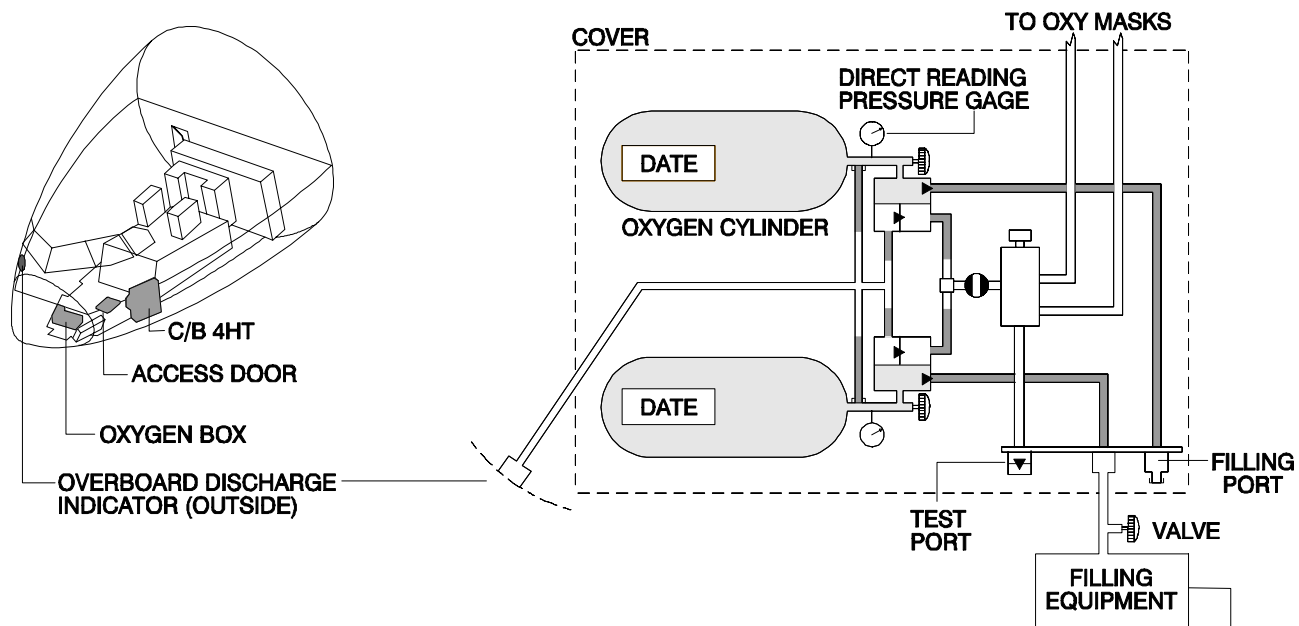
Note: Perform the same procedure to fill the second cylinder.

TEST

Before testing, the safety clip and tag must be removed and the circuit breaker 4HT must be closed.

Test: make sure that the pressure value shown on the pressure gages on the cylinders is the same as the pressure indications on the DOOR/OXY page of the SD.

After you have checked the oxygen pressure on the DOOR/OXY page, don't forget to put the aircraft back to its initial configuration and to close the access.

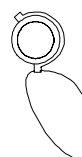


WARNING NOTICE

DANGER

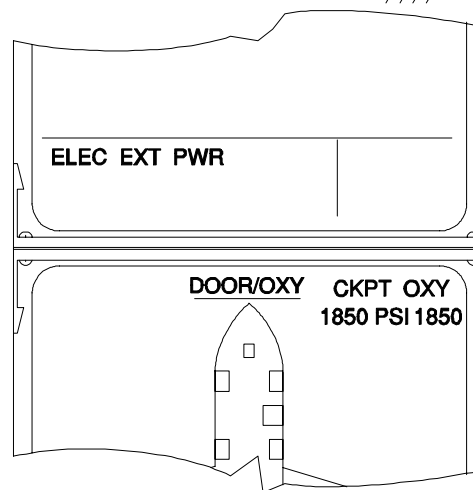
The oxygen filling procedure is very dangerous. Wear safety glasses and use the correct filling equipment.

C/B 4HT



DO NOT REMOVE

Name: Joop Schneider
Reason: Oxygen filling procedure



SYSTEM DISPLAY

STUDENT NOTES:

FQW4200 GE Metric

CREW OXYGEN SYSTEM DISTRIBUTION LEAKAGE TEST - ONE BOTTLE

Warnings
Set-Up
Preparation Test Installation
Test Procedure
Close-Up

Perform the nitrogen test, to make sure that there are no leaks in the crew oxygen system.

WARNINGS

As working with oxygen is very dangerous, read the safety precautions carefully:

- Keep all hydrocarbons (fuels, lubricants, etc.) away from all sources of oxygen. Oxygen becomes explosive when it touches hydrocarbons.
- Clean the tools and make sure that your hands are clean to prevent contamination of the oxygen system.
- Put dry, clean, metal or plastic plugs on all pipes or units which are removed temporarily. Put each pipe in a sealed vinyl bag. (Unwanted materials in the oxygen system could damage the system.)

SET-UP

In the avionics compartment, close the oxygen cylinder valve.

In the cockpit, bleed the oxygen system by releasing the OXYGEN/CREW SUPPLY pushbutton (the OFF legend comes on) and by pushing the PRESS TO TEST AND RESET button a sufficient number of times on one of the masks.

In the avionics compartment, disconnect the LP hose. Put a blanking cap on the hose and put it in a sealed vinyl bag. Install the blanking cap, which is stowed in the oxygen stowage bag, on the port of the oxygen regulator.

PREPARATION TEST INSTALLATION

The test installation consists of:

- a nitrogen source,
- a pressure-reducing valve,
- a bleed valve,
- an isolation valve,
- a pressure gage and
- a quick disconnect coupling.

Remove the blanking cap of the test port and connect the test installation to the test port.

TEST PROCEDURE

Push the OXYGEN/CREW SUPPLY pushbutton (the OFF legend goes off). Open the nitrogen source and set the pressure to 130 psig with the pressure-reducing valve.

As soon as the pressure is 130 psig, close the isolation valve and the pressure-reducing valve.

Keep the system pressurized for at least half an hour.

When the pressure stays stable and does not decrease, open the isolation valve and open the bleed valve.

If the pressure decreases, find the leak with the special oxygen leak detection fluid, and replace the defective component. Do the test again.

CLOSE-UP

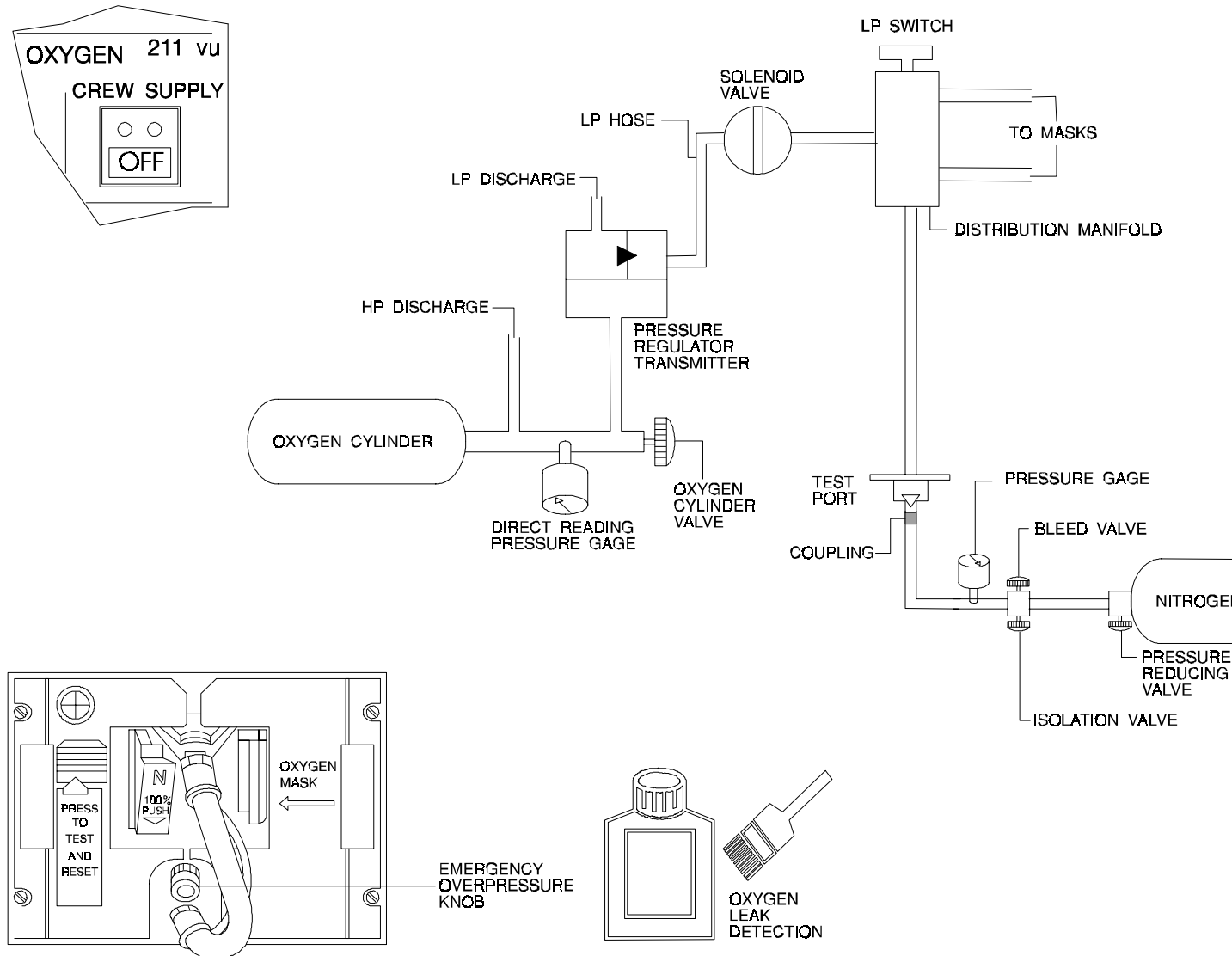
Disconnect the test installation and put a blanking cap on the test port.

Install a new conical seal on the low pressure hose and install the hose on the port of the oxygen regulator.

Slowly open the oxygen cylinder valve by 3 to 4 turns. Stop for 90 seconds to let the pressure become stable. Then fully open the oxygen cylinder valve. Bleed each mask stowage box 2 or 3 times: at the same time, push and immediately release:

- the PRESS TO TEST AND RESET control button
- the emergency overpressure knob.

Finally release the OXY/CREW SUPPLY pushbutton.



FQW4200 GE Metric

STUDENT NOTES

CREW OXYGEN SYSTEM DISTRIBUTION LEAKAGE TEST - TWO BOTTLES

Warnings
Set-Up
Preparation Test Installation
Test Procedure
Close-Up

Perform the nitrogen test, to make sure that there are no leaks in the crew oxygen system.

WARNINGS

As working with oxygen is very dangerous, read the safety precautions carefully:

- Keep all hydrocarbons (fuels, lubricants, etc.) away from all sources of oxygen. Oxygen becomes explosive when it touches hydrocarbons.
- Clean the tools and make sure that your hands are clean to prevent contamination of the oxygen system.
- Put dry, clean, metal or plastic plugs on all pipes or units which are removed temporarily. Put each pipe in a sealed vinyl bag. (Unwanted materials in the oxygen system could damage the system.)

SET-UP

In the avionics compartment, close the oxygen cylinder valves.

Energize the aircraft electrical circuits and do the EIS start procedure.

In the cockpit, bleed the oxygen system by releasing the OXYGEN/CREW SUPPLY pushbutton (the OFF legend comes on) and by pushing the PRESS TO TEST AND RESET button on one of the oxygen masks a sufficient number of times on one of the masks.

In the avionics compartment, disconnect the LP hoses. Put blanking caps on the hoses and put them in sealed vinyl bags. Install the blanking caps, which are stowed in the oxygen stowage bags, on the ports of the oxygen regulators.

PREPARATION TEST INSTALLATION

The test installation consists of:

- a nitrogen source,
- a pressure-reducing valve,
- a bleed valve,
- an isolation valve,
- a pressure gage and
- a quick disconnect coupling.

Remove the blanking cap of the test port and connect the test installation to the test port.

TEST PROCEDURE

Push the OXYGEN/CREW SUPPLY pushbutton (the OFF legend goes off). Open the nitrogen source and set the pressure to 130 psi with the pressure-reducing valve.

As soon as the pressure is 130 psi, close the isolation valve and the pressure-reducing valve.

Keep the system pressurized for at least half an hour.

When the pressure stays stable and does not decrease, open the isolation valve and open the bleed valve.

If the pressure decreases, find the leak with the special oxygen leak detection fluid, and replace the defective component. Do the test again.

CLOSE-UP

Disconnect the test installation and put a blanking cap on the test port.

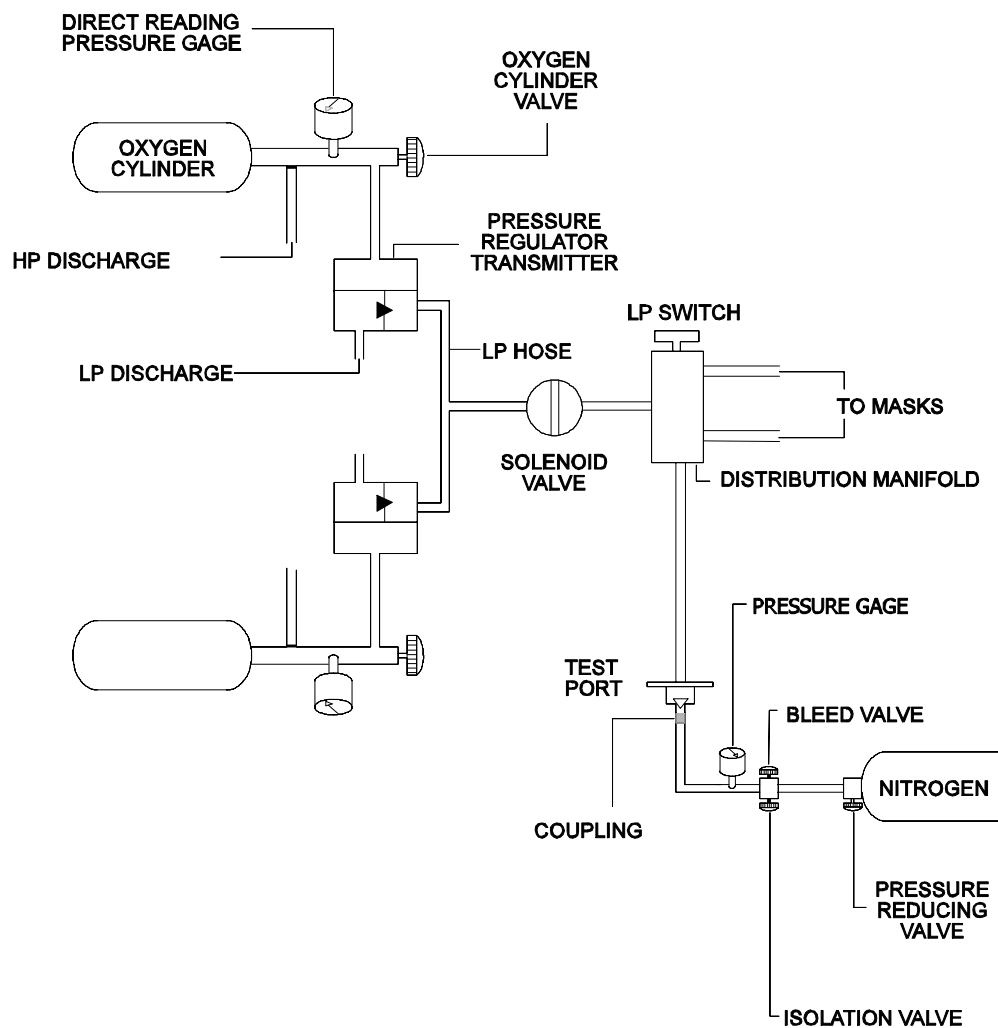
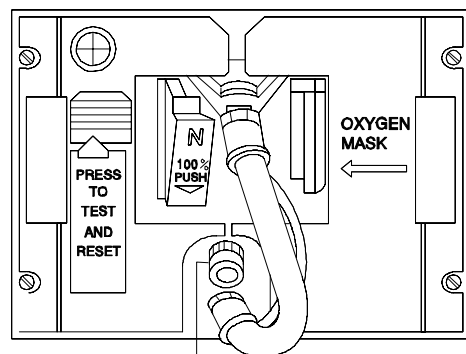
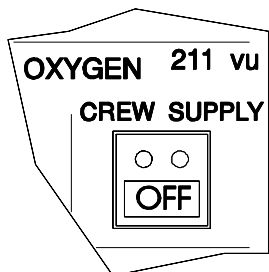
Install new conical seals on the low pressure hoses and install the hoses on the ports of the oxygen regulators.

Slowly open the oxygen cylinder valves by 3 to 4 turns. Stop for 90 seconds to let the pressure become stable. Then fully open the oxygen cylinder valve. Bleed each mask stowage box 2 or 3 times: at the same time, push and immediately release:

- the PRESS TO TEST AND RESET control button,
- the emergency overpressure knob.

Finally release the OXY/CREW SUPPLY pushbutton (the OFF legend comes on).

De-energize the aircraft electrical circuits.



STUDENT NOTES:

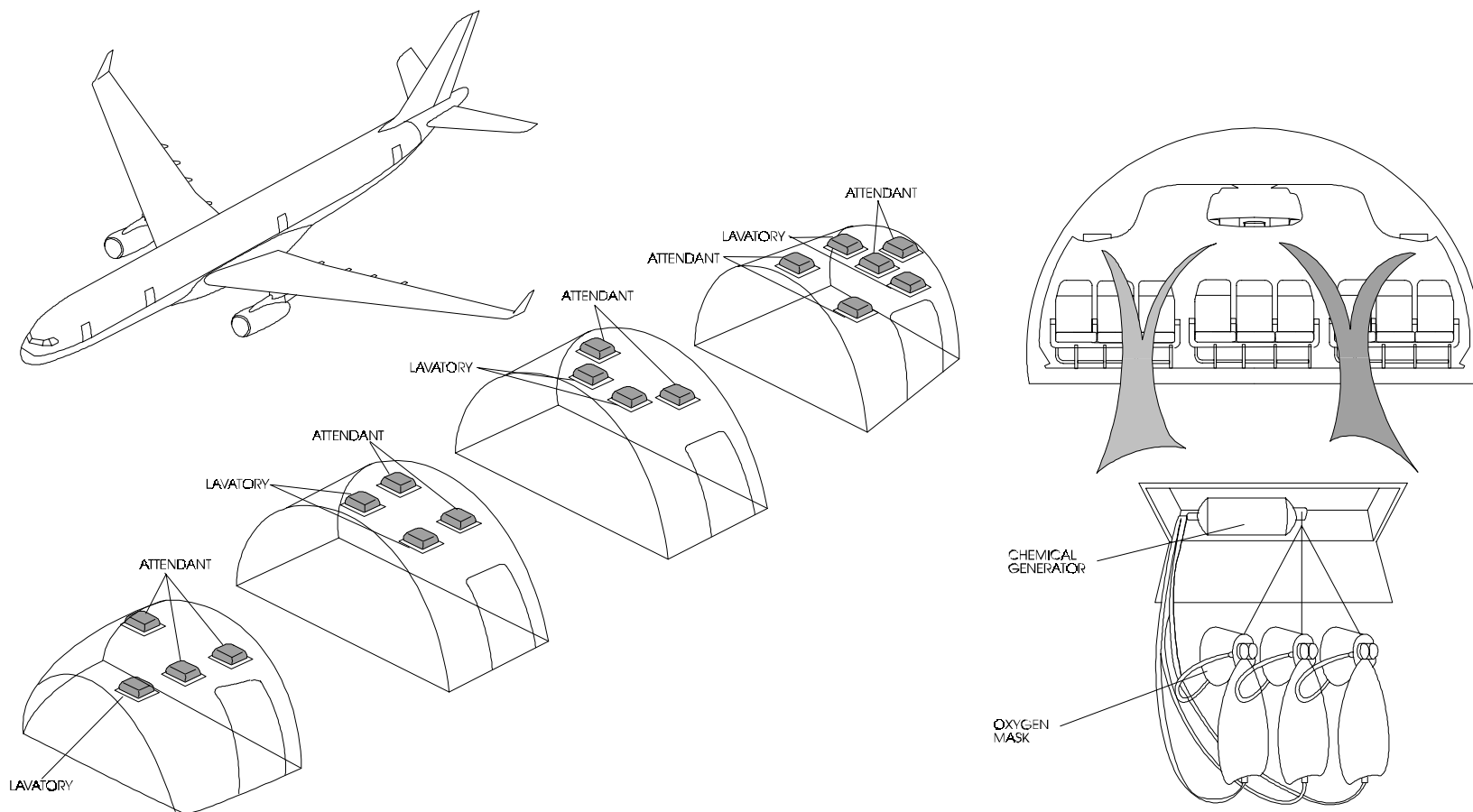
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PASSENGER OXYGEN SYSTEM PRESENTATION

Location
Logic

LOCATION

The passenger mask containers are located above passenger seats, in the lavatories & galleys ceilings and above each attendant seat.



FQW4200 GE Metric

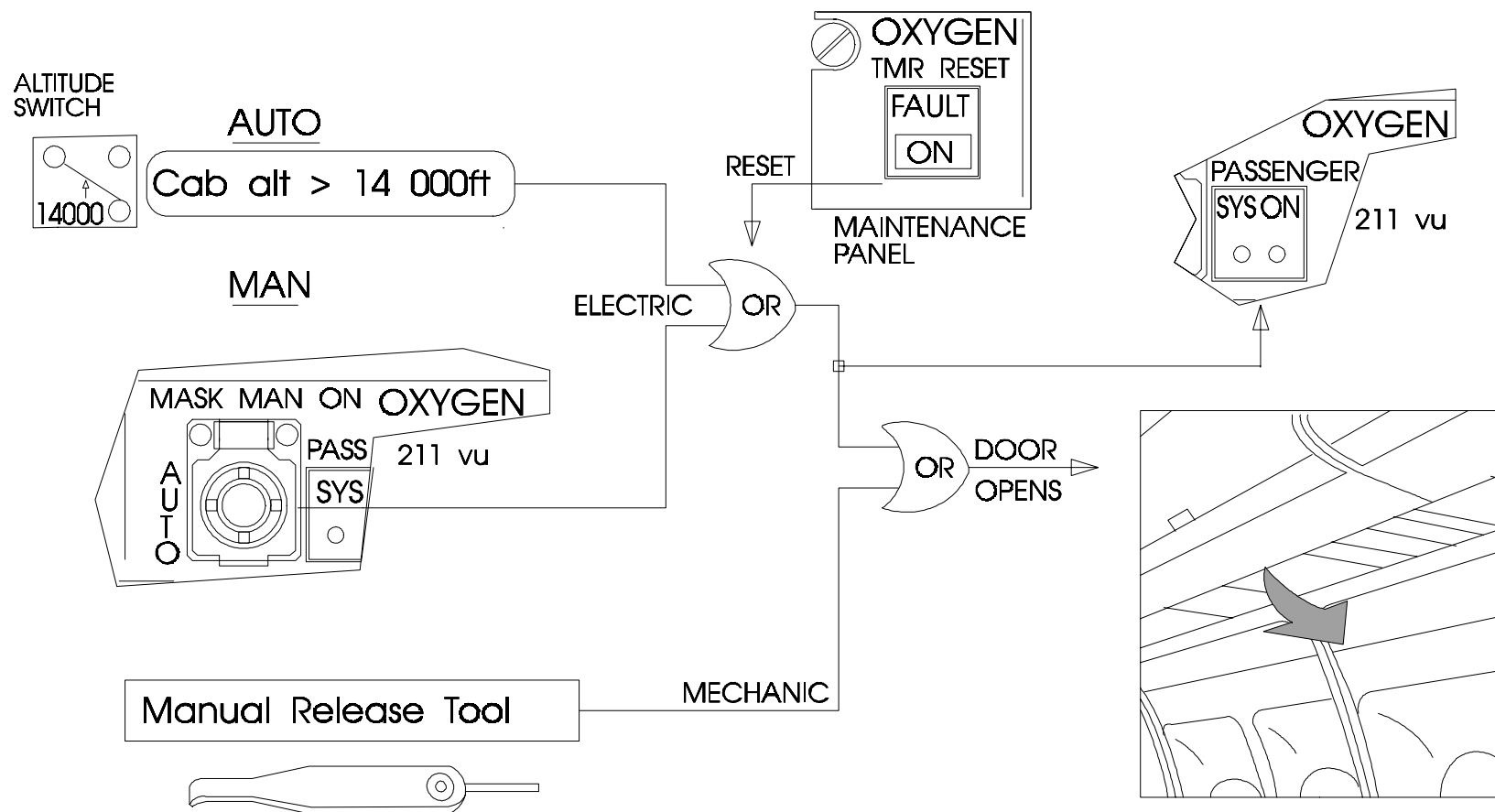
LOGIC

The masks are presented automatically when the cabin altitude is higher than 14 000 ft or manually on crew action.

The "SYS ON" indicator light comes on when the passenger oxygen system is electrically operated.

A reset is available to rearm the electrical system after mask restowage.

A manual release tool allows mechanical opening of the door in case of failure of the container door opening system.



FQW4200 GE Metric

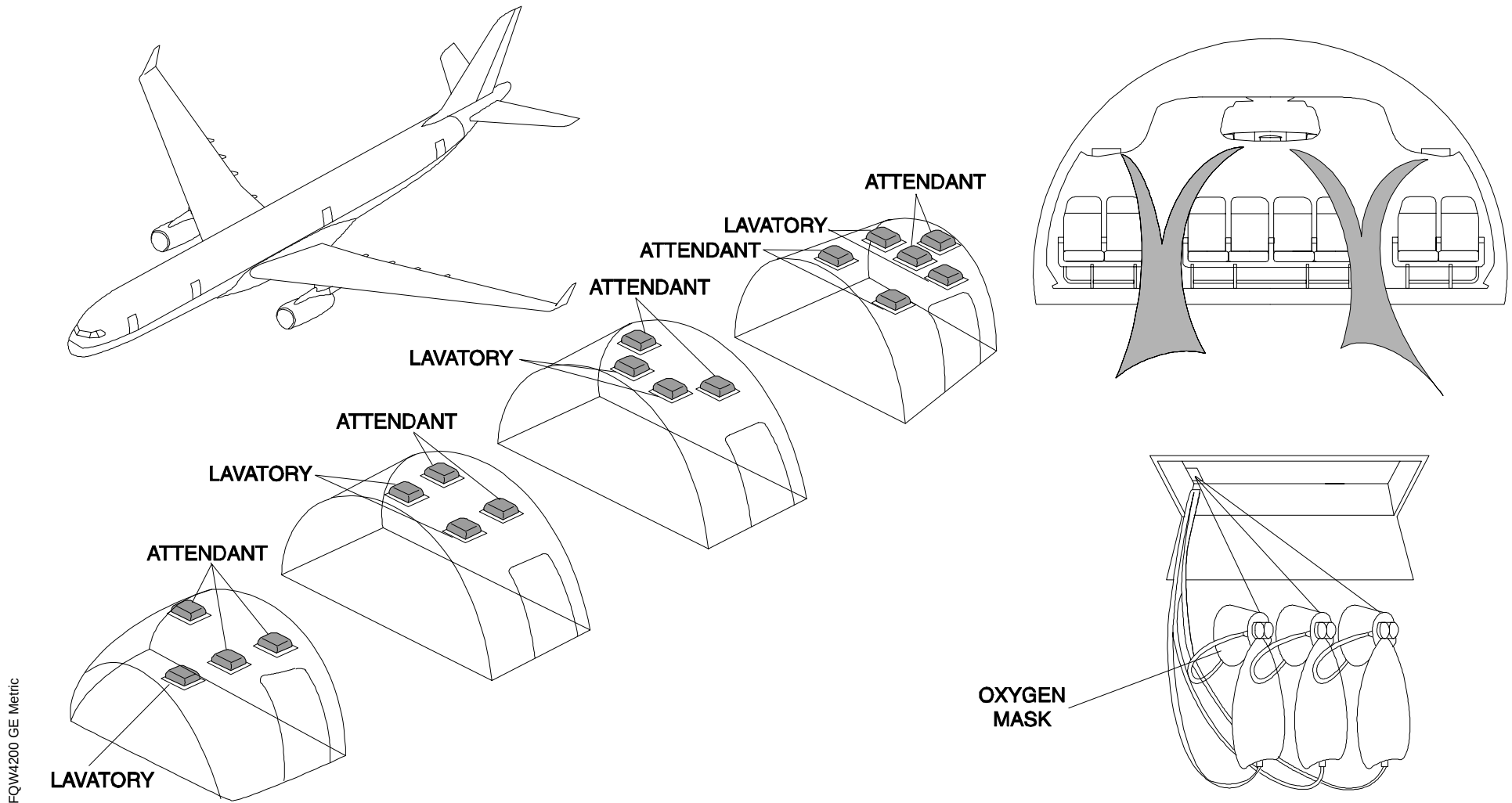
STUDENT NOTES

PASSENGER GASEOUS OXYGEN SYSTEM PRESENTATION

Location
Logic

LOCATION

The passenger mask containers are located above passenger seats, in the lavatories & galleys ceilings and above each attendant seat.



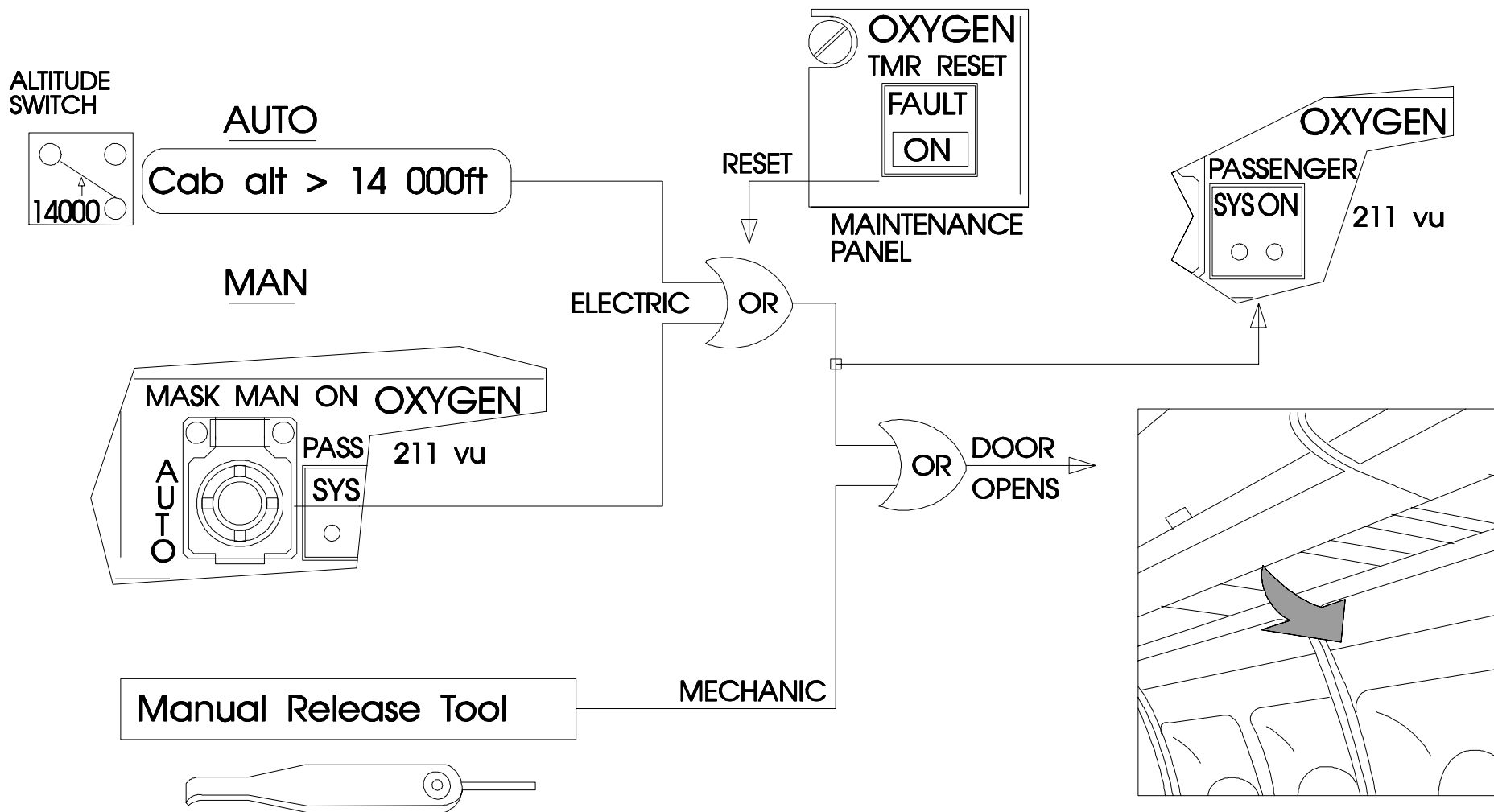
LOGIC

The masks are presented automatically when the cabin pressure decreases to a pressure equivalent to 14 000 ft (4 267 m) or manually on crew action.

The "SYS ON" indicator light comes on when the passenger oxygen system is electrically operated.

The system can be set to its pre-operation condition if the cabin pressure is above a pressure equivalent to 14 000 ft (4 267 m).

A manual release tool allows mechanical opening of the door in case of failure of the container door opening system.



FQW4200 GE Metric

STUDENT NOTES

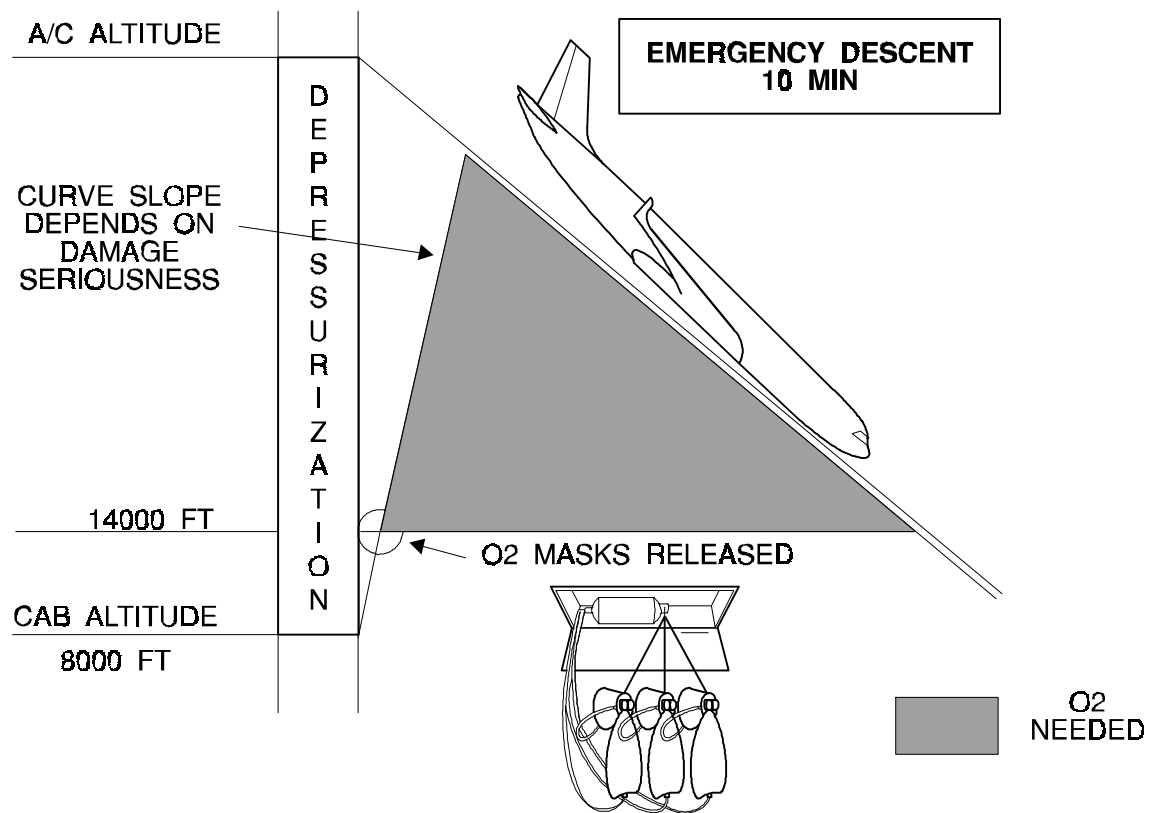
PASSENGER OXYGEN DESCRIPTION AND OPERATION

Triggering
Automatic Operation
Manual Operation
Reset Operation

TRIGGERING

The chemical oxygen generator supplies a flow of low pressure oxygen for a minimum time of 15 minutes.

In case of rapid cabin depressurization, oxygen masks are automatically presented to passengers.



AUTOMATIC OPERATION

The System Operates Automatically when the altitude pressure switch closes. A tape announcement is transmitted over the passenger address system.

The taped announcement may be stopped by momentarily pressing the TIMER RESET pushbutton.

After 6 sec. the TIME DELAY relays supply the door latch assemblies via an other circuit for safety.

The FAULT light on the TIMER RESET pushbutton comes on if a failure of both SWITCH OFF relays occurs.

MANUAL OPERATION

The passengers oxygen masks may be presented at any time through a MASK MAN ON pushbutton.

The taped announcement may be stopped by momentarily pressing the TIMER RESET pushbutton.

The MANUAL OVERRIDE relays are energized and supply the door electrical assembly control circuits.

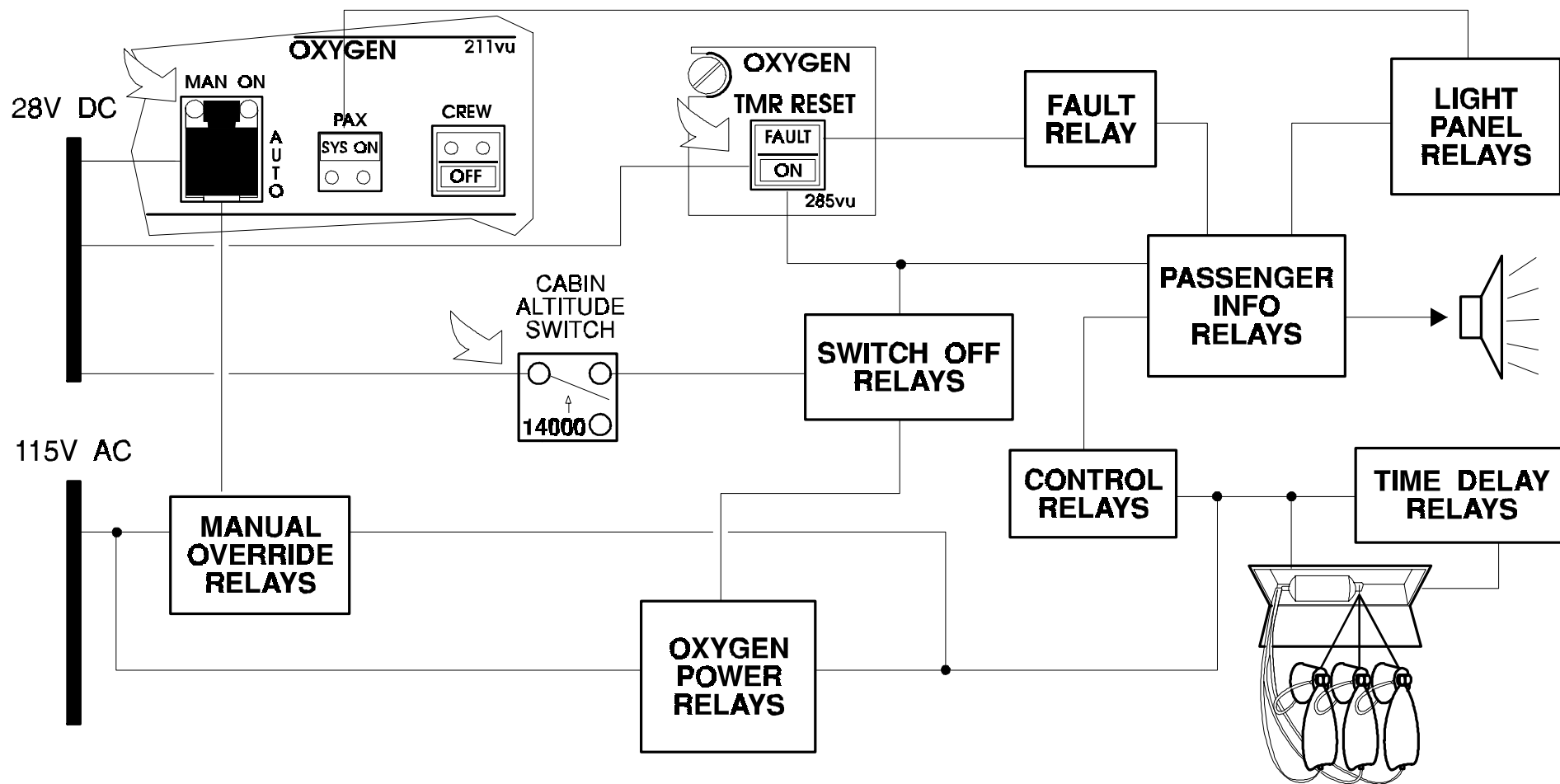
The PASSENGER INFO and SWITCH OFF relays are energized via the CONTROL relays.

RESET OPERATION

Momentarily pressing the TIMER RESET pushbutton deactivates the PASSENGER INFO and the SWITCH OFF relays.

The system is reset by momentarily pressing the TIMER RESET pushbutton on the maintenance panel.

On ground, used chemical oxygen units must be replaced and all masks restowed.



FQW4200 GE Metric

STUDENT NOTES:

FQW4200 GE Metric

PASSENGER GASEOUS OXYGEN SYSTEM DESCRIPTION / OPERATION

General
Description
Operation
Engine Burst
Reset
Overpressure
Servicing

GENERAL

The passenger gaseous oxygen system supplies oxygen to each oxygen container in case of an emergency. The rate of the oxygen flow depends on the altitude, down to zero at 10.000 ft (3050 m).

With the gaseous oxygen system, the oxygen supply can be stopped at 10.000 ft (3050 m) and then be re-started if the aircraft has to climb to clear another obstacle. The gaseous oxygen system has no characteristic flight profile. Since the flow is greater with the altitude, the lower the flight is performed the longer the oxygen supply lasts.

DESCRIPTION

High pressure oxygen is kept in oxygen cylinder assemblies located behind sidewall linings in the FWD cargo compartment.

The standard system is equipped with 5 oxygen cylinders. Up to 18 oxygen cylinders can be installed at airline request.

When the system is operated, low pressure oxygen from the pressure reducers is supplied to the two main supply lines. One line is installed below the cabin floor along the right hand side of the aircraft. The other line is installed above the cabin ceiling. Riser or fall lines are installed at approximately every 4 frames to connect the overhead distribution lines, which are connected to the emergency oxygen containers, to the main supply lines.

OPERATION

When the cabin pressure decreases to a pressure equivalent to 14.000 ft (4300 m) the altitude switch closes. This starts the automatic operation of the oxygen system.

If the altitude switch fails, the "MAN ON" pushbutton switch can be pushed at any time to start the operation of the oxygen system.

The altitude switch or the "MAN ON" pushbutton switch send a signal to open the system shutoff valves and low pressure oxygen is supplied. The bleed/vent valve first bleeds the remaining air in the lines and then closes to let the system fill with oxygen.

The "SYS ON" light on panel 211VU comes on as soon as one system shutoff valve is fully open.

A taped message is transmitted over the passenger address system. The oxygen masks container doors open pneumatically and the masks fall down. Oxygen only flows to the masks which are pulled down.

ENGINE BURST

The system is protected to prevent an oxygen flow to a damaged supply line. The differential pressure switch is energized when one of the system shutoff valves is open. If one of the main distribution lines is damaged, there will be an important pressure difference between the main distribution lines.

The differential pressure switch sends a signal to close the related main distribution valve and the appropriate non return valve will stop the oxygen supply to the related main distribution line.

In the engine burst area, the pneumatically controlled riser line shutoff valves will stop the oxygen supply to a damaged riser or fall line.

RESET

After operation, the system has to be reset by pushing the "RESET" pushbutton switch on panel 285VU. The system can only be reset if the cabin pressure is above a pressure equivalent to 14.000 ft (4300 m).

The system shutoff valves will close, the main distribution shutoff valves open (if they were closed).

The "ON" light on the "RESET" pushbutton switch and the "SYS ON" indicator light go off.

NOTE: if one or more relays, which energize the valves and lights, do not return to the pre-operation position, the "ON" light on the "RESET" pushbutton switch does not go off.

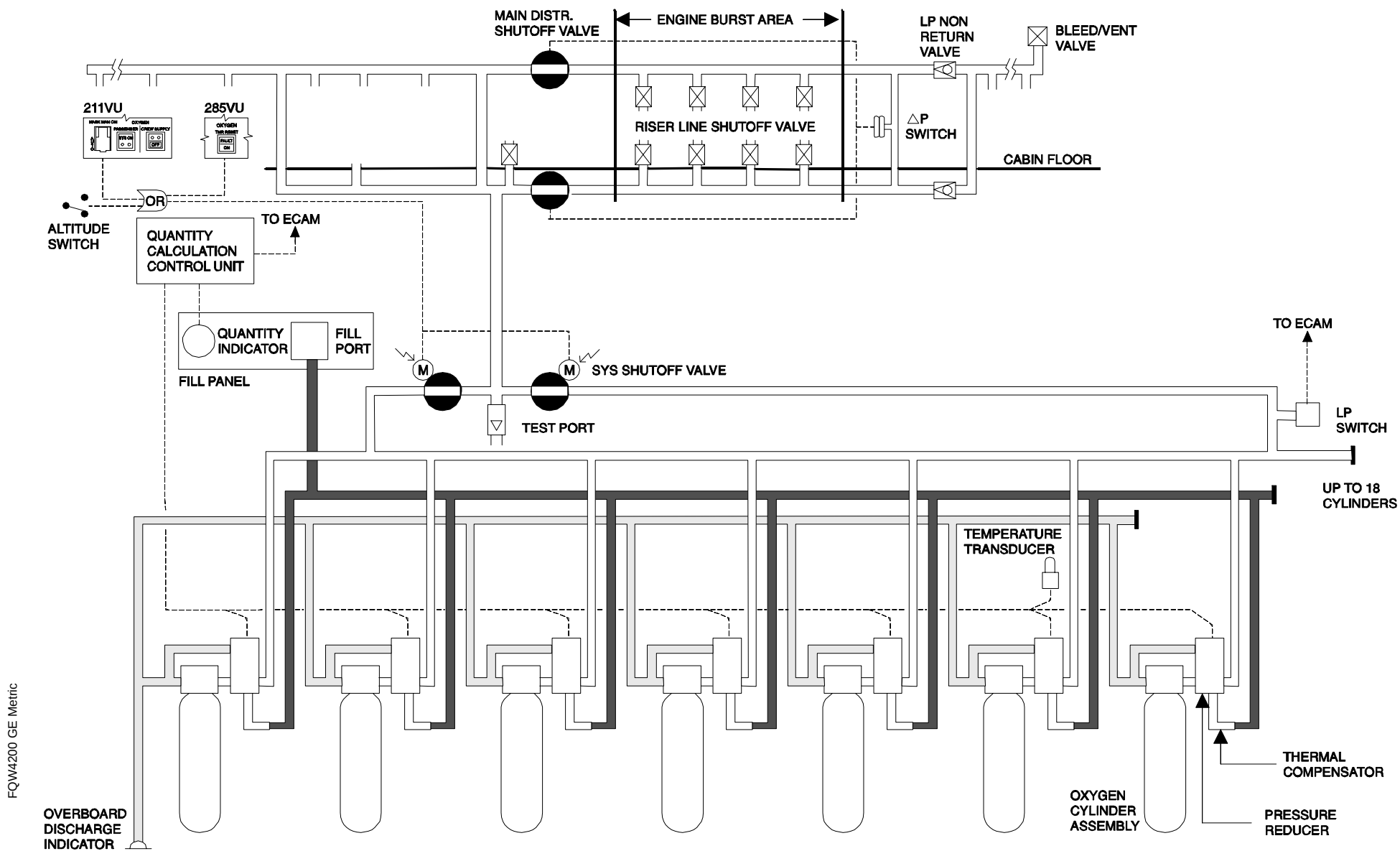
OVERPRESSURE

When the high pressure in the oxygen cylinder increases to 191 bar (2770 psi) or when the pressure in the low pressure part increases to 8 bar (116 psi), oxygen is released overboard.

SERVICING

The system can be filled from an external oxygen source through the fill port located on the fill panel.

Thermal compensators are installed in the fill lines to prevent dangerous increases in temperature during filling.



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STUDENT NOTES

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PASSENGER GASEOUS OXYGEN SYSTEM CONTROL & INDICATING

- General
- Normal High Pressure Indication
- High Pressure Failure Indications
- Regul Lo Press Indication
- Central Maintenance Computer Indications

GENERAL

The oxygen control and indicating system controls the supply and operation of the gaseous oxygen system.

It also provides information to the cockpit systems about the condition of the passenger oxygen system.

The manually operated controls are located on panels 211VU and 285VU.

NORMAL HIGH PRESSURE INDICATION

The temperature adjusted pressure in the oxygen cylinders is indicated on the DOOR/OXY page.

The pressure is above 1600 psi (110 bar):

PAX OXY - white

1700 - green

HIGH PRESSURE FAILURE INDICATIONS

When the pressure in the oxygen cylinders becomes too low, the following indications are possible:

The pressure is between 1200 and 1600 psi (83 and 110 bar):

PAX OXY - white

1350 - green, amber underline

The pressure is between 200 and 1200 psi (14 and 83 bar):

PAX OXY - white

1100 - green pulsing, amber underline

The pressure is less than 200 psi (14 bar):

PAX OXY - amber

150 - amber, amber underline

The pressure is not available or out of range:

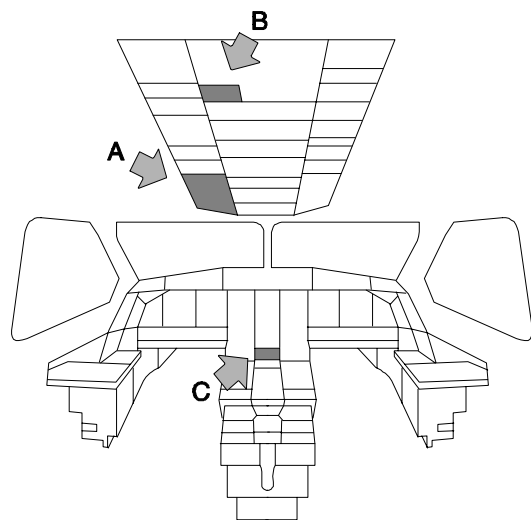
PAX OXY - amber

XX - amber

REGUL LO PRESS INDICATION

The amber "REGUL LO PR" indication is shown in the following cases:

- The pressure in the low pressure system is less than 4.4 bar (64 psi).
- One of the main distribution shutoff valves does not fully open when the RESET pushbutton is pushed.
- One of the main distribution shutoff valves is not fully open and the system has not been operated.
- Both main distribution shutoff valves are closed and the system has been operated.
- One of the system shutoff valves is not fully closed and the system has not been operated.
- One of the system shutoff valves does not close when the RESET pushbutton is pushed.
- The system does not return to the normal condition after a system RESET.



EXAMPLES:

C

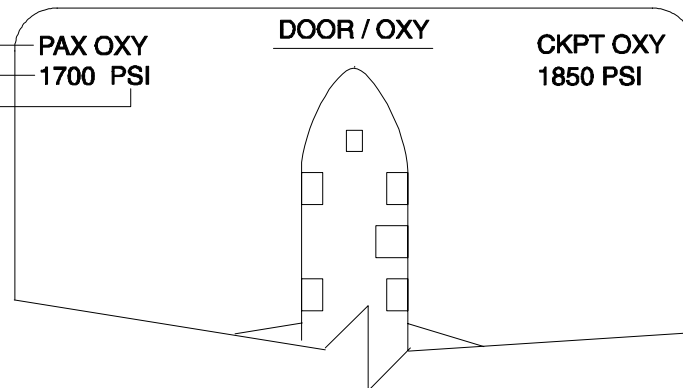
NORMAL CONDITION
PRESSURE ABOVE 1600 PSI (110 BAR)

WHITE
GREEN
CYAN

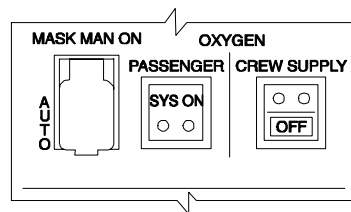
PAX OXY
1700 PSI

DOOR / OXY

CKPT OXY
1850 PSI

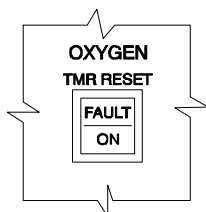


A



211VU
OVERHEAD PANEL

B



285VU
MAINTENANCE PANEL

PRESSURE BETWEEN
1200 AND 1600 PSI
(83 AND 110 BAR)

WHITE
GREEN
AMBER

PAX OXY
1350 PSI

CYAN

PRESSURE BETWEEN
200 AND 1200 PSI
(14 AND 83 BAR)

WHITE
GREEN
PULSING
AMBER

PAX OXY
1100 PSI
REGUL LO PR

CYAN

PRESSURE LESS THAN
200 PSI (14 BAR)

AMBER

PAX OXY
150 PSI
REGUL LO PR

CYAN

PRESSURE NOT AVAILABLE
OR OUT OF RANGE

AMBER
AMBER

PAX OXY
XX PSI
REGUL LO PR

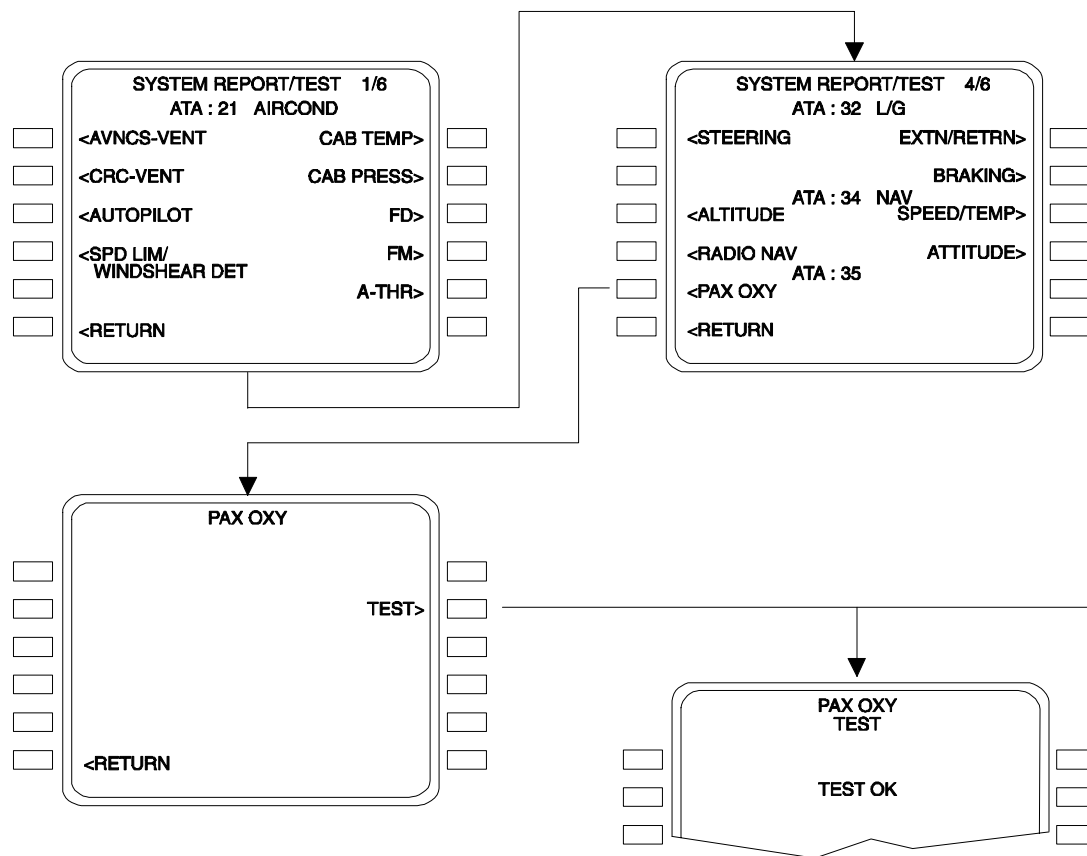
CYAN

CENTRAL MAINTENANCE COMPUTER INDICATIONS

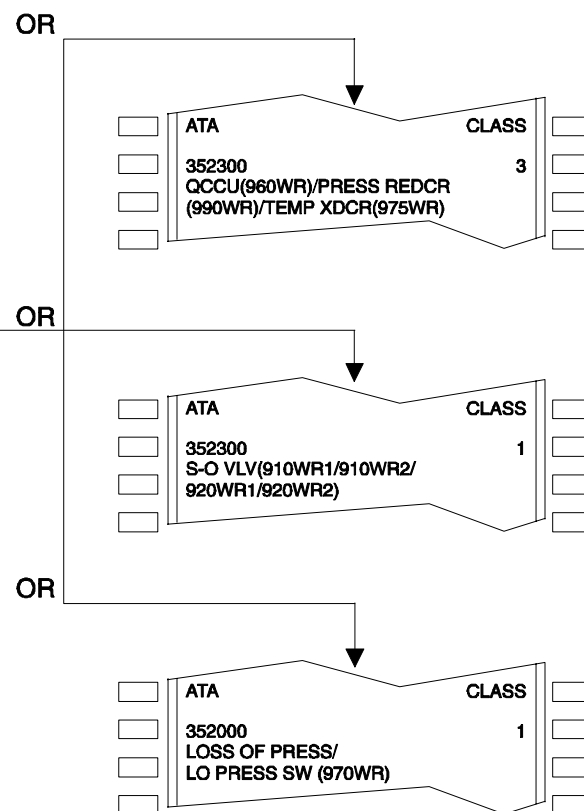
Failure messages are send to the CMC. You can get access to these messages by pressing the PAX OXY button on the System Report/Test Page 4/6.

Applicable messages appear when:

- The QCCU fails.
- The pressure transducer fails.
- The temperature transducer fails.
- The system shutoff valve(s) is (are) not in the correct position.
- The main distribution shutoff valve(s) is (are) not in the correct position.
- Both main distribution shutoff valves are closed.
- The pressure in the low pressure system is too low.
- The low pressure switch fails.



EXAMPLES:



STUDENT NOTES

PASSENGER OXYGEN COMPONENTS

- Safety Precautions
- Altitude Switch
- Chemical Emergency Oxygen Container
- Door Latch
- Door Stop
- Continuous Flow Mask
- Emergency Oxygen Generator

SAFETY PRECAUTIONS

Make sure that the MASK MAN ON pushbutton is guarded.

Make sure that the work area is clean and clear.

STUDENT NOTES

ALTITUDE SWITCH

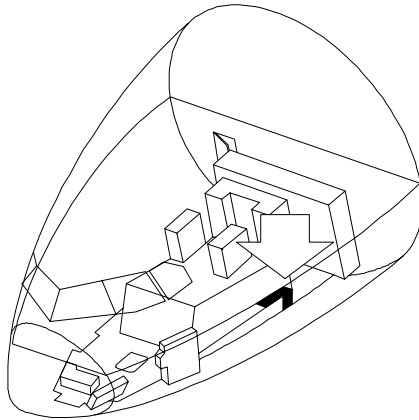
FIN : 16 WR

ZONE : 121

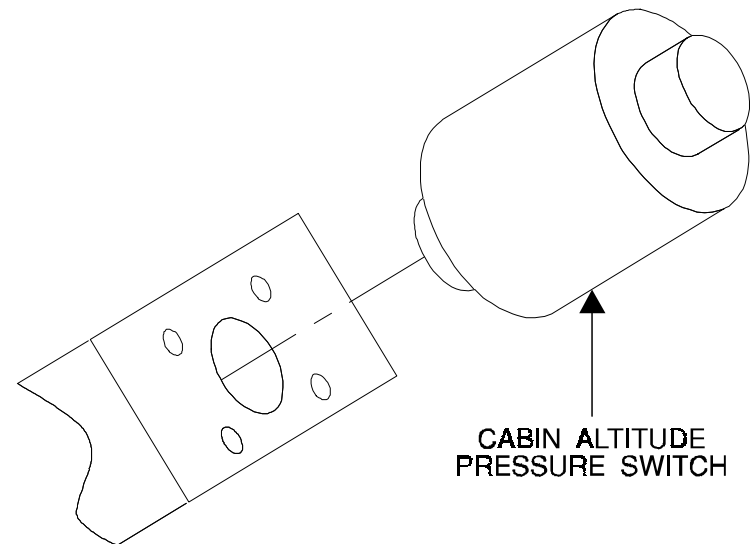
COMPONENT DESCRIPTION

The altitude switch closes when the cabin altitude pressure falls to a pressure equivalent to 14,000 ft.

This starts the emergency oxygen supply system.



ALTITUDE SWITCH



CABIN ALTITUDE
PRESSURE SWITCH

CHEMICAL EMERGENCY OXYGEN CONTAINER

FIN : 51 WR to 512 WR

ZONE : 200

COMPONENT DESCRIPTION

Each oxygen container comprises:

- a container box,
- a door fitted with a latch assembly,
- a door stop,
- a chemical emergency oxygen container,
- continuous flow oxygen masks with flexible supply hoses.

DOOR LATCH

COMPONENT DESCRIPTION

The electrical latch assembly holds the door of the chemical emergency oxygen-container closed when de-energized.

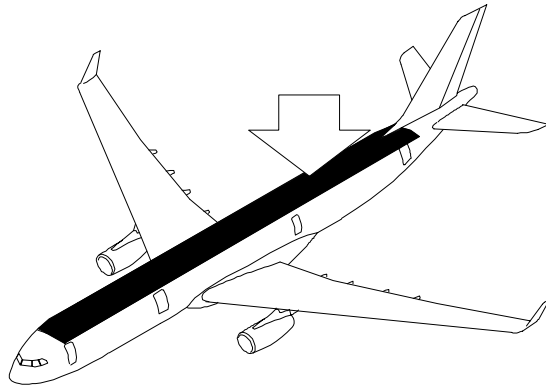
The door opens when the latch assembly is energized, or manually with the release tool.

DOOR STOP

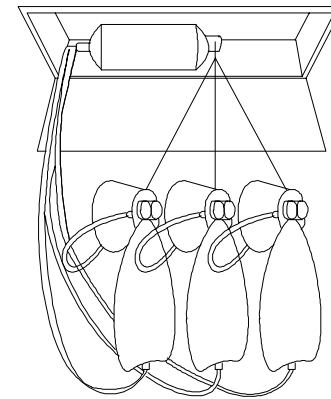
COMPONENT DESCRIPTION

The door stop is installed in the emergency oxygen-container.

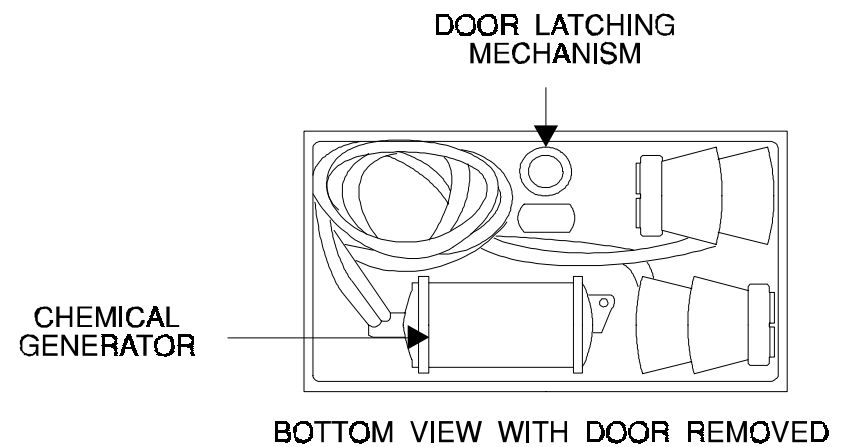
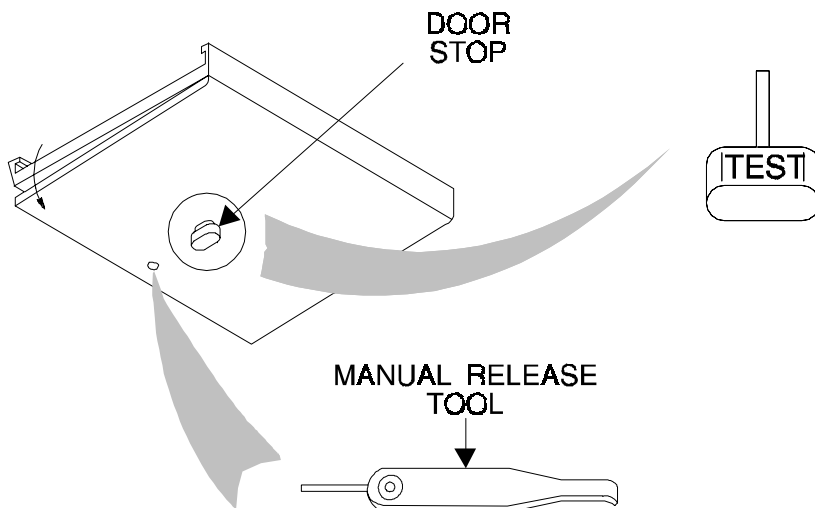
The door stop allows an inspection and a test of the emergency oxygen-container door opening to be performed. The door stop allows the door to open by a few degrees.



CHEMICAL EMERGENCY OXYGEN CONTAINER



FQW4200 GE Metric



CONTINUOUS FLOW MASK

COMPONENT DESCRIPTION

When the first user pulls the mask towards his face, the release pin starts the chemical oxygen generation.

Oxygen flows through the flexible hose to the mask. The flow indicator inflates when the oxygen flows.

EMERGENCY OXYGEN GENERATOR

COMPONENT DESCRIPTION

The chemical generator uses the basic principal of thermal decomposition of sodium chlorate.

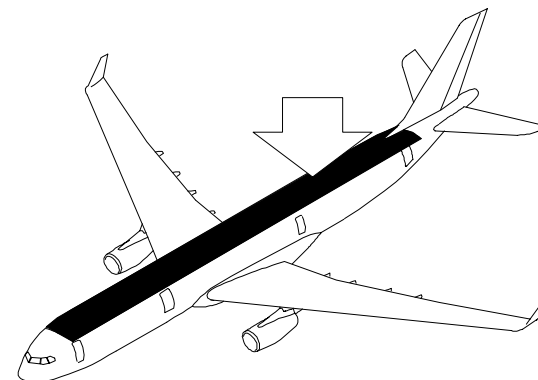
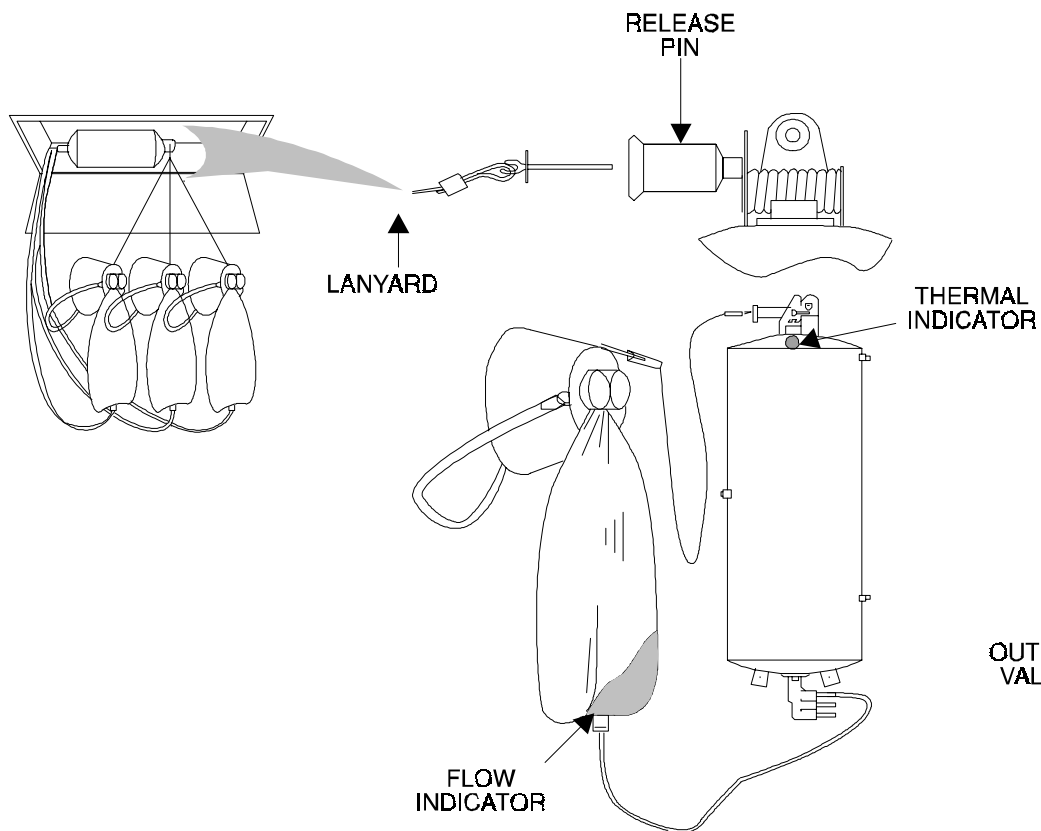
An indicator turning from pink to blue shows the generator has been used.

COMPONENT OPERATION

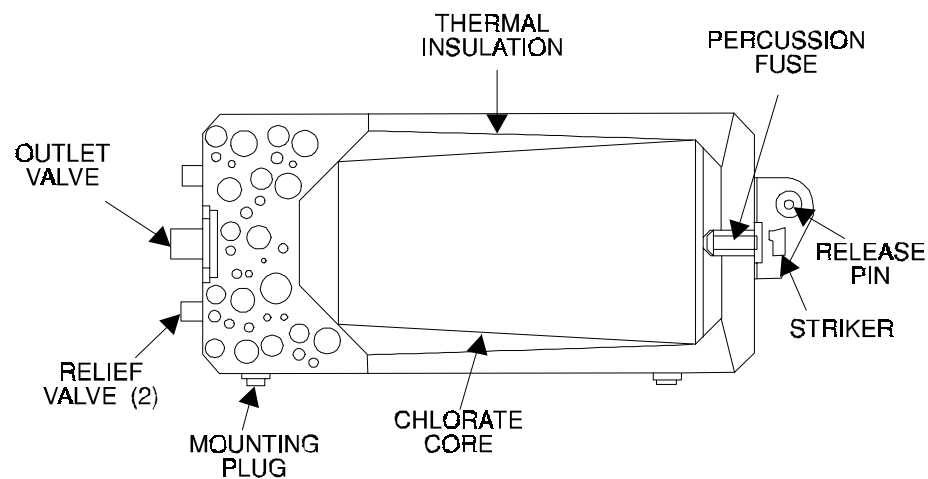
The generator actuator consists of a spring-loaded striker and a percussion fuse.

A relief valve fitted on the generator housing protects the generator against high internal pressure.

CONTINUOUS FLOW MASK



EMERGENCY OXYGEN GENERATOR



FQW4200 GE Metric

STUDENT NOTES

FQW4200 GE Metric

PASSENGER GASEOUS OXYGEN SYSTEM COMPONENTS - 1

- Oxygen Cylinder Assembly
- Overboard Discharge Indicator
- Thermal Compensator
- Fill Port
- Fill Panel Indicator
- Pressure Reducer
- System Shutoff Valve
- Low Pressure Switch
- Test Port
- Temperature Transducer

SAFETY PRECAUTIONS

Keep all hydrocarbons (fuels, lubricants, etc) away from all sources of oxygen. Oxygen becomes explosive when it is allowed to mix with hydrocarbons.

Use clean tools and make sure that your hands are clean to prevent contamination of the oxygen system.

Put dry, clean, metal or plastic plugs on all pipes or units removed temporarily. Put each pipe or unit in a sealed vinyl bag. Unwanted materials in the oxygen system could damage the system.

STUDENT NOTES

OXYGEN CYLINDER ASSEMBLY

FIN/ZONE

FIN : 7601WR
7602WR
7603WR
7604WR
7605WR
7606WR
7607WR

ZONE : 132

COMPONENT DESCRIPTION

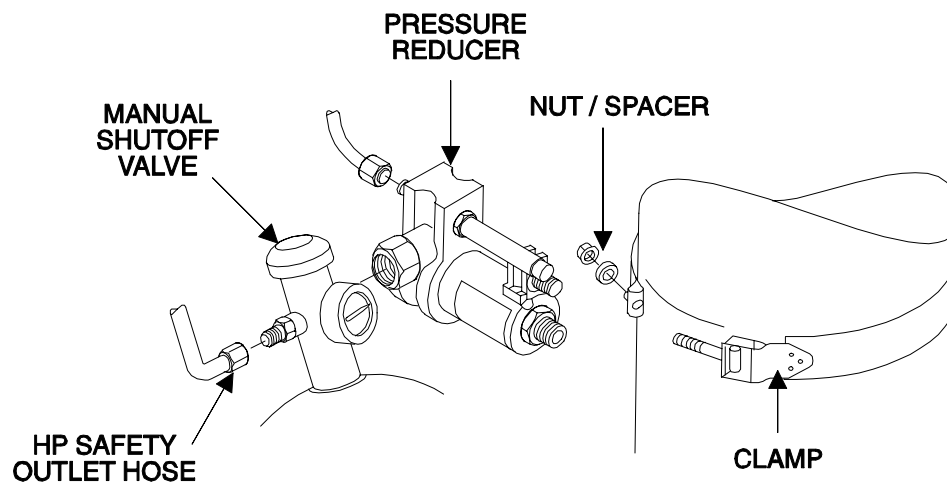
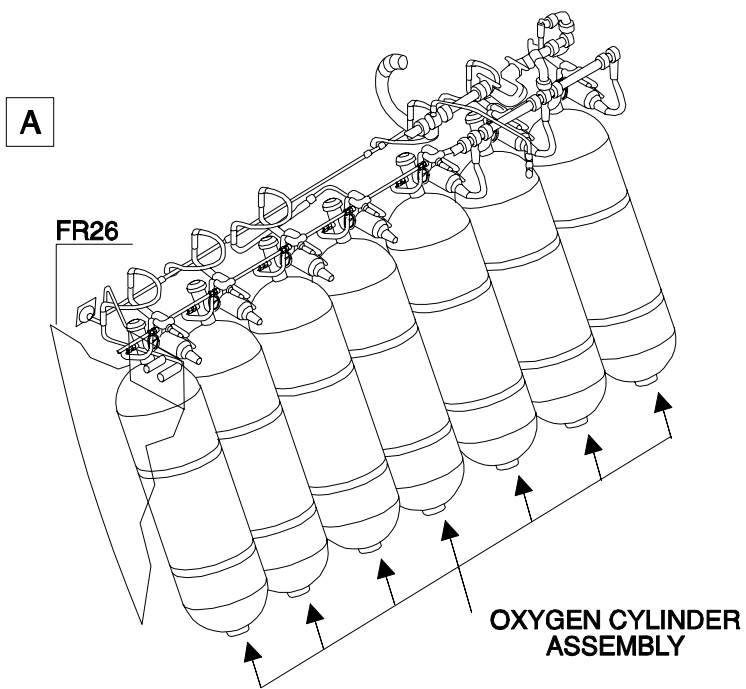
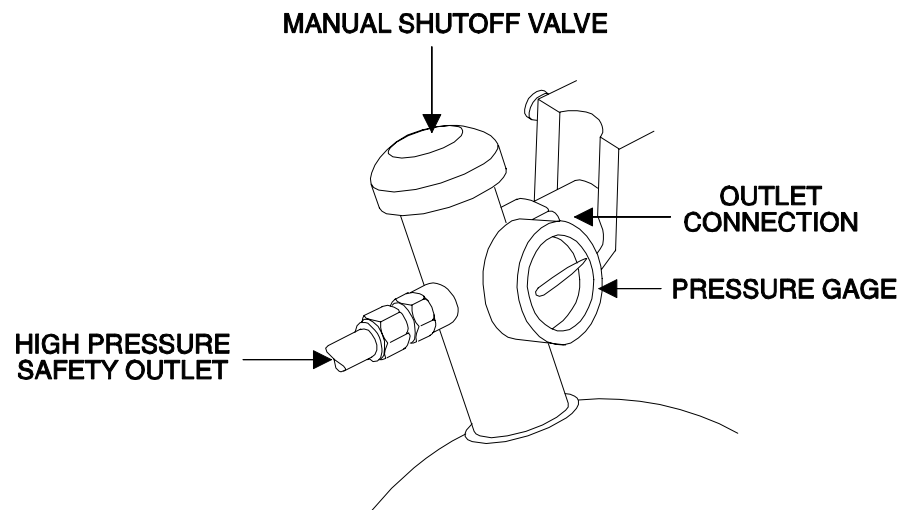
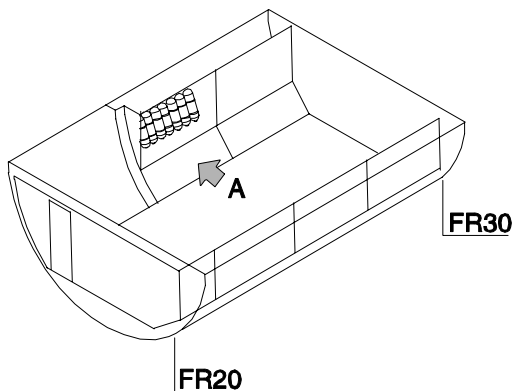
The passenger oxygen storage cylinders are made of composite material. They each have a capacity of 115.7 ft³ (3.27 m³) Normal Temperature Pressure Dry (NTPD) at a pressure of 1850 psi (127.553 bar). The useful capacity is 94 ft³ (2.66 m³) NTPD.

The cylinders are connected together in parallel.

SPECIAL DESIGN

The cylinder head has :

- a manual shutoff valve,
- a pressure gage,
- an outlet connection and,
- a high pressure safety outlet.



FQW4200 GE Metric

OVERBOARD DISCHARGE INDICATOR

FIN/ZONE

FIN : 7521WR

ZONE : 132

COMPONENT DESCRIPTION

The overboard discharge indicator forms a continuous surface with the outside skin of the aircraft. It is connected to the high pressure outlet of the cylinder assemblies and the safety outlet of the pressure reducers. The overboard discharge indicator provides a visual indication from outside the aircraft. The disc blows out when the pressure in an oxygen cylinder assembly increases to 191 bar (2770 psi) or when the pressure in the low pressure system increases to 8 bar (116 psi).

THERMAL COMPENSATOR

FIN/ZONE

FIN : 7621WR

7622WR

7623WR

7624WR

7625WR

7626WR

7627WR

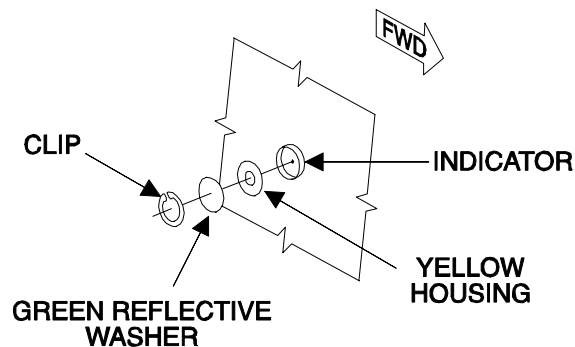
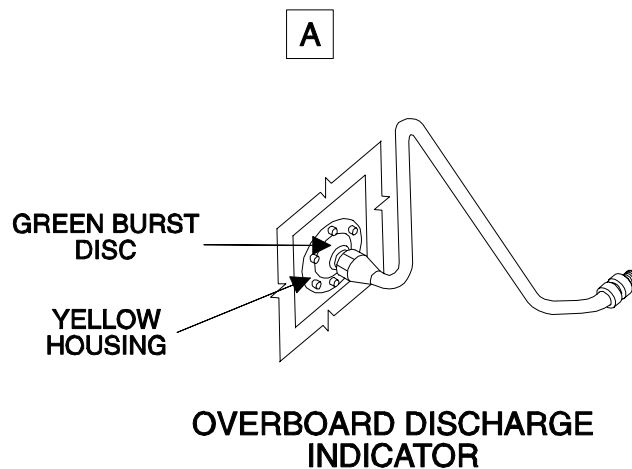
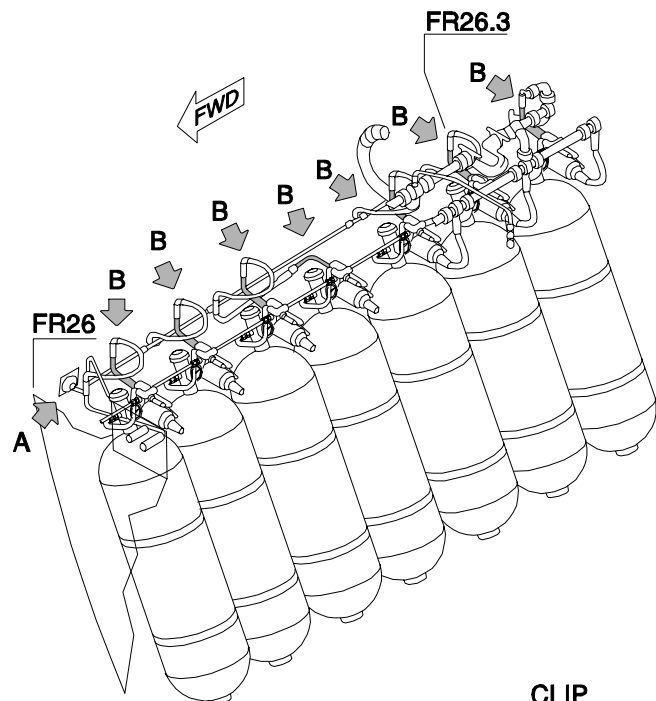
ZONE : 132

COMPONENT DESCRIPTION

The thermal compensator prevent dangerous increases in temperature when you fill the cylinders. They are installed in the fill lines immediately in front of the pressure reducers.

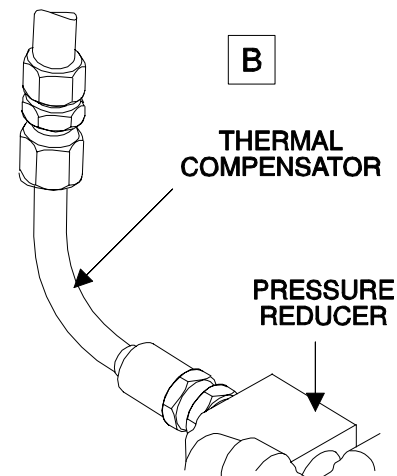
They have :

- a tube,
- an internal part with a large surface area and a high thermal inertia with high thermal coupling to the tube.

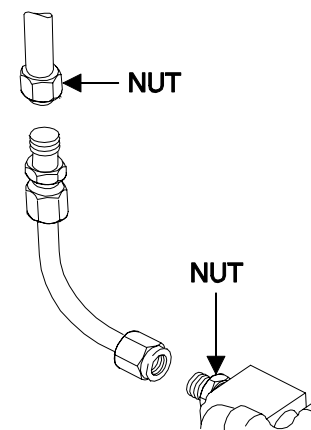


REMOVAL / INSTALLATION

NOTE: Before installation, the pipe, connected to the Overboard Discharge Indicator, must be flushed with dry and clean LP air, to blow unwanted particles out of the overboard discharge pipe.



THERMAL COMPENSATOR



REMOVAL / INSTALLATION

FILL PORT

FIN/ZONE

FIN : 7520WR

ZONE : 132

COMPONENT DESCRIPTION

The fill port enables the oxygen cylinders to be filled from an external source.

The fill port has :

- a flow restrictor,
- a filter (20 micron),
- an external cap with a safety chain.

FILL PANEL INDICATOR

FIN/ZONE

FIN : 980WR

ZONE : 132

COMPONENT DESCRIPTION

The fill panel indicator shows the arithmetic mean pressure in the oxygen cylinder assemblies. This function is to show the system pressure when you fill the system. The indicator shows a pressure up to 152 bar (2204 psi). The signal to the indicator comes from the Quantity Calculation and Control Unit.

PRESSURE REDUCER

FIN/ZONE

FIN : 990WR1

990WR2

990WR3

990WR4

990WR5

990WR6

990WR7

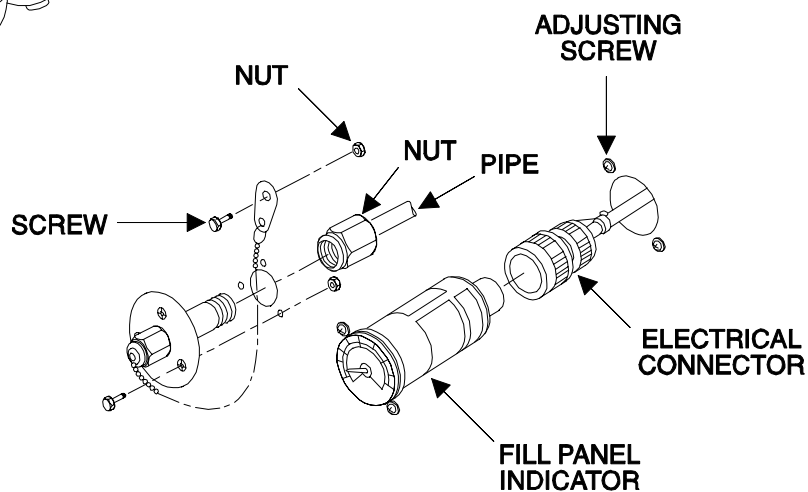
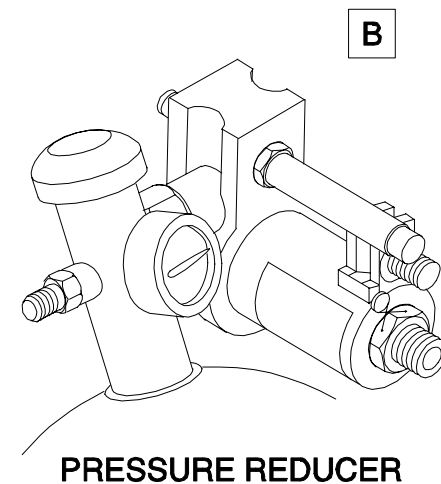
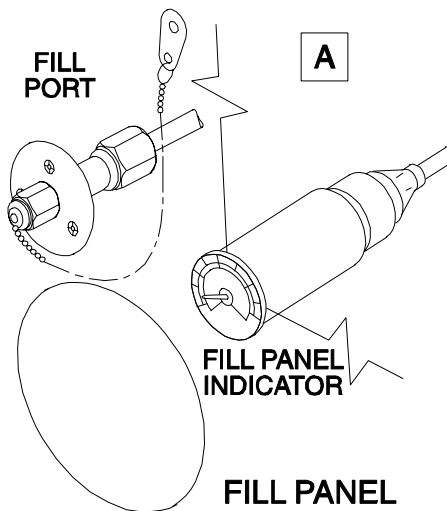
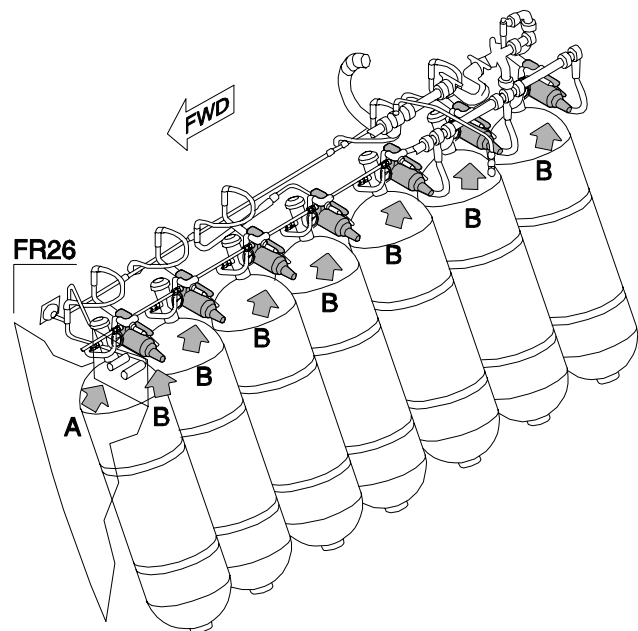
ZONE : 132

COMPONENT DESCRIPTION

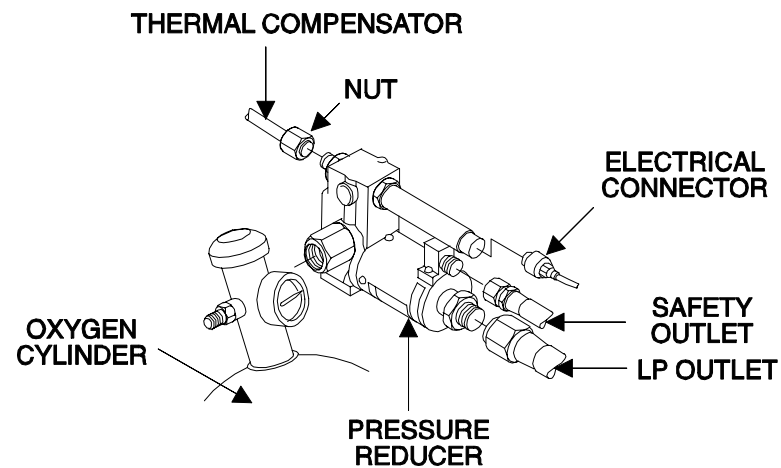
Each pressure reducer has :

- a high pressure inlet port from the oxygen cylinder,
- a high pressure fill inlet with a non return valve,
- a low pressure outlet with a non return valve,
- a safety outlet with a non return valve connected to the overboard discharge indicator,
- a pressure transducer which sends a signal to the Quantity Calculation and Control Unit.

The pressure reducer has an outlet pressure of 6 bar (87 psi). If the outlet pressure increases to above 8 bar (116 psi) the safety outlet releases the oxygen through the overboard discharge indicator.



REMOVAL / INSTALLATION



REMOVAL / INSTALLATION

SYSTEM SHUTOFF VALVE

FIN/ZONE

FIN : 910WR1
910WR2

ZONE : 132

COMPONENT DESCRIPTION

As soon as the system shutoff valves are open, low pressure oxygen is supplied to the oxygen distribution system.

The system shutoff valves are electrically operated.

Each valve has two internal switches :

- the "valve fully open" switch which operates the "SYS ON" light,
- the "valve not fully closed" switch which gives the "REGUL LO PRESS" warning if,
 - the valve does not close when the "RESET" pushbutton is pushed,
 - the valve is not fully closed when the system is not operated.

A signal is also sent to the Central Maintenance Computer.

LOW PRESSURE SWITCH

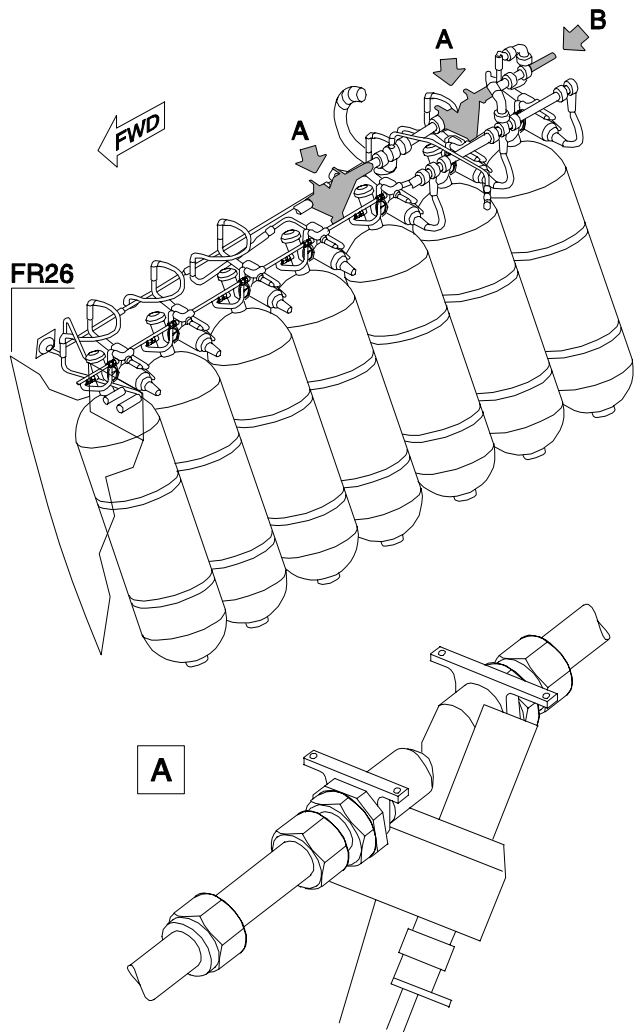
FIN/ZONE

FIN : 970WR

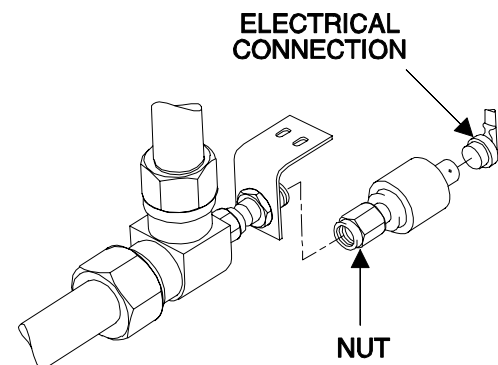
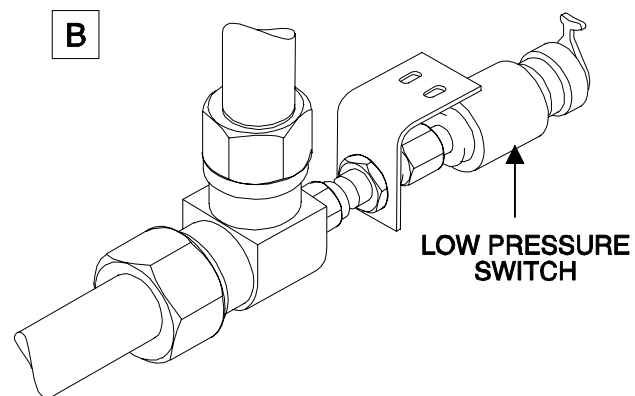
ZONE : 132

COMPONENT DESCRIPTION

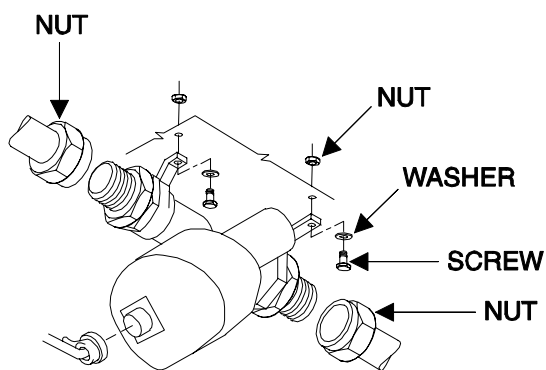
The low pressure switch sends a "REGUL LO PRESS" message to the engine/warning display and a signal to the Central Maintenance Computer if the pressure in the low pressure system decreases to 4.4 bar (63.2 psi).



SYSTEM SHUTOFF VALVE



REMOVAL / INSTALLATION



REMOVAL / INSTALLATION

TEST PORT

FIN/ZONE
FIN : 7504WR

ZONE : 132

COMPONENT DESCRIPTION

The test port is installed in the low pressure system after the shutoff valves. It is used to make system tests and leak checks of the oxygen distribution system.

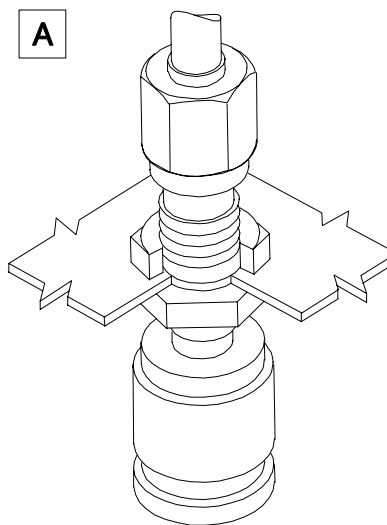
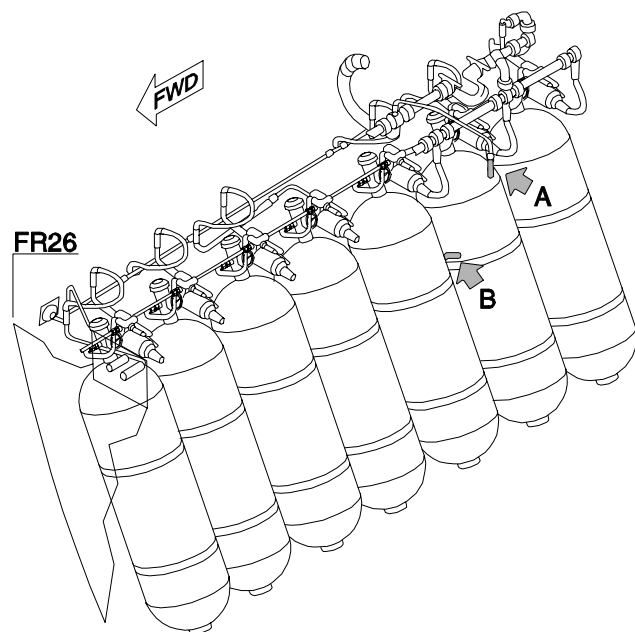
TEMPERATURE TRANSDUCER

FIN/ZONE
FIN : 975WR

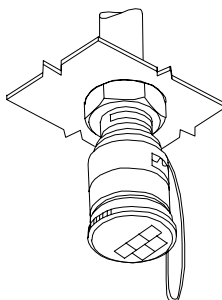
ZONE : 132

COMPONENT DESCRIPTION

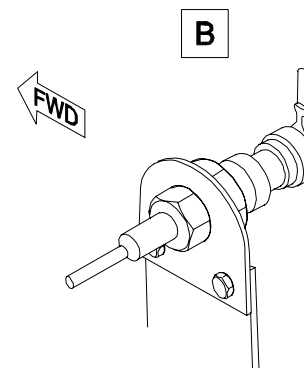
The temperature transducer receives its power from and sends a signal to the Quantity Calculation and Control Unit.
It has an operation range of -15 deg.C to +70 deg.C (5 deg.F to 158 deg.F).



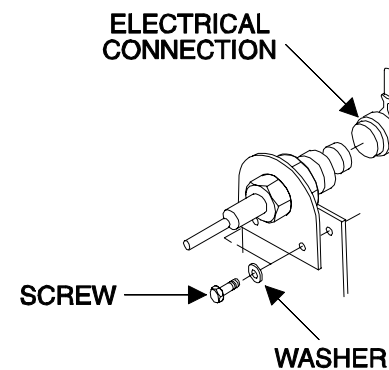
TEST PORT



REMOVAL / INSTALLATION



TEMPERATURE
TRANSDUCER



REMOVAL / INSTALLATION

STUDENT NOTES

PASSENGER GASEOUS OXYGEN SYSTEM COMPONENTS - 2

- Altitude Pressure Switch
- Quantity Calculation and Control Unit
- Main Distribution Shutoff Valve
- Non Return Valve
- Bleed/Vent Valve
- Riser Line Shutoff Valve
- Differential Pressure Switch
- Emergency Oxygen Container

SAFETY PRECAUTIONS

Keep all hydrocarbons (fuels, lubricants, etc) away from all sources of oxygen. Oxygen becomes explosive when it is allowed to mix with hydrocarbons.

Use clean tools and make sure that your hands are clean to prevent contamination of the oxygen system.

Put dry, clean, metal or plastic plugs on all pipes or units removed temporarily. Put each pipe or unit in a sealed vinyl bag. Unwanted materials in the oxygen system could damage the system.

STUDENT NOTES

ALTITUDE PRESSURE SWITCH

FIN/ZONE

FIN : 16WR

ZONE : 211

COMPONENT DESCRIPTION

The altitude pressure switch closes if the cabin pressure decreases to a pressure equivalent to 14000 ft (4270 m).

This opens the "OPEN" relays and the "PASS INFO" relay.

The system shutoff valves open when the "OPEN" relays are energized.

QUANTITY CALCULATION AND CONTROL UNIT

FIN/ZONE

FIN : 960WR

ZONE : 122

COMPONENT DESCRIPTION

The QCCU receives signals from the:

- temperature transducer,
- pressure transducers.

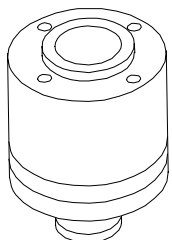
The QCCU sends a signal of the:

- arithmetic mean pressure to the fill panel indicator
- temperature adjusted pressure to the engine/warning display (passenger oxy display).

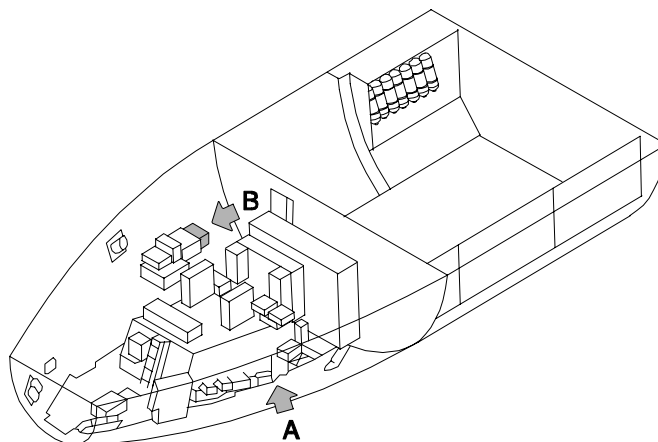
The QCCU also sends a signal to the Central Maintenance Computer and ECAM if:

- the QCCU does not operate,
- the signal from the temperature transducer is out of range or not continuous,
- the signal from one or more of the pressure transducers is out of range or not continuous.

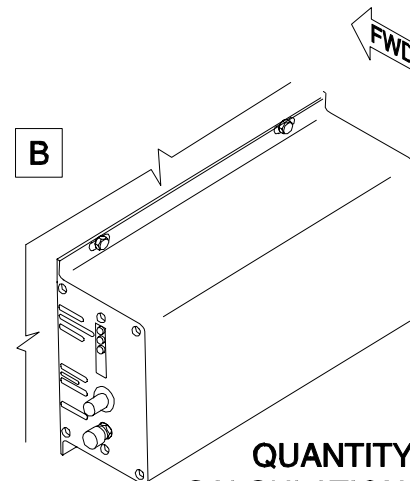
A



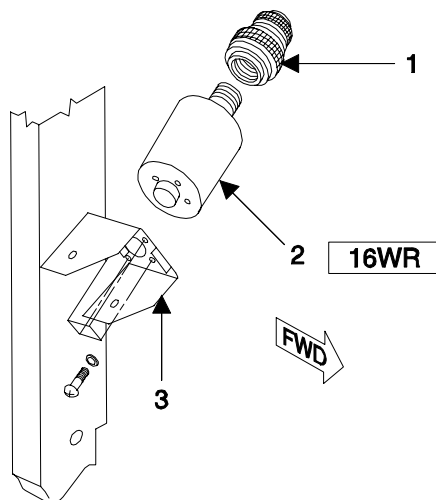
**ALTITUDE
PRESSURE
SWITCH**



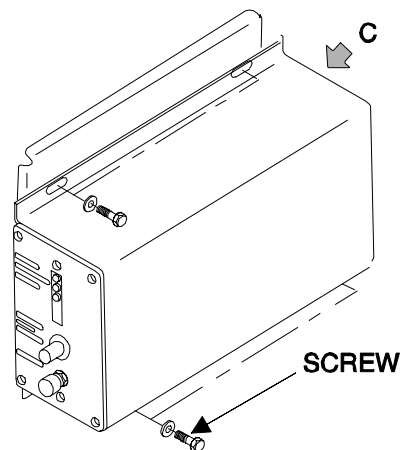
B



**QUANTITY
CALCULATION AND
CONTROL UNIT**

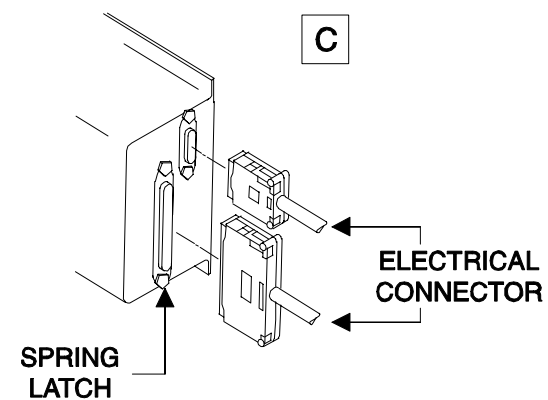


REMOVAL / INSTALLATION



SCREW

C



**SPRING
LATCH**

**ELECTRICAL
CONNECTOR**

REMOVAL / INSTALLATION

MAIN DISTRIBUTION SHUTOFF VALVE

FIN/ZONE

FIN : 920WR1
920WR2

ZONE : 132
253

COMPONENT DESCRIPTION

The main distribution shutoff valves are electrically opened or closed.

Each shutoff valve has two internal switches:

- the "valve not fully open" switch. When the "RESET" pushbutton is pushed and the valve does not fully open, the "REGUL LO PRESS" message is sent to the EWD. A signal is also sent to the CMC.
- the "valve fully closed" switch. If both main distribution shutoff valves are closed and the system has been operated, a message is sent to the EWD.

NON RETURN VALVE

FIN/ZONE

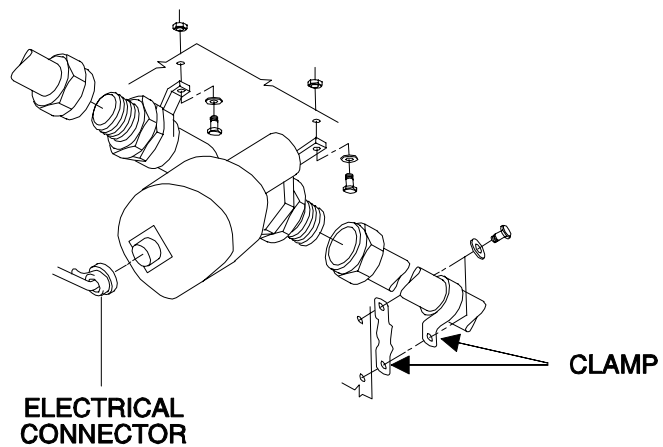
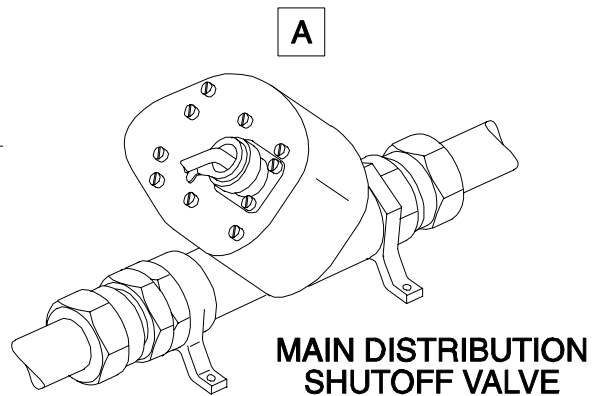
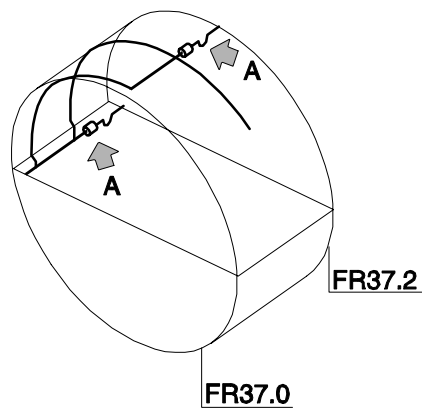
FIN : 7500WR
7501WR

ZONE : 264

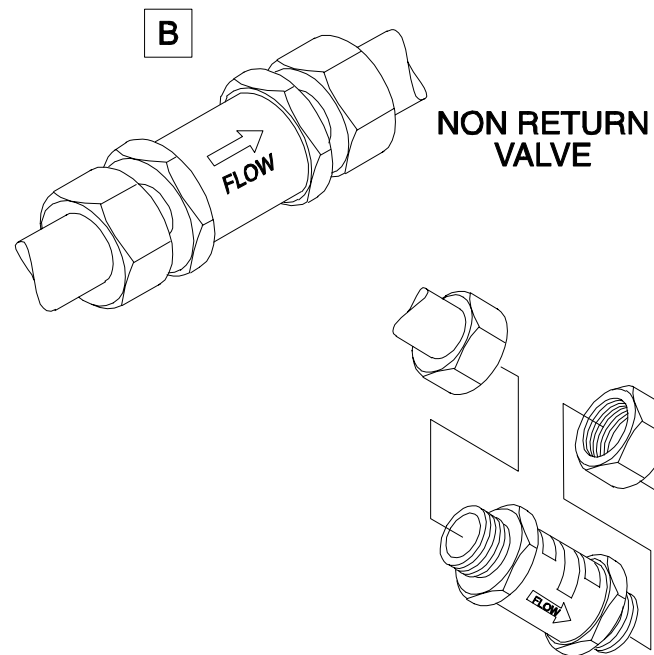
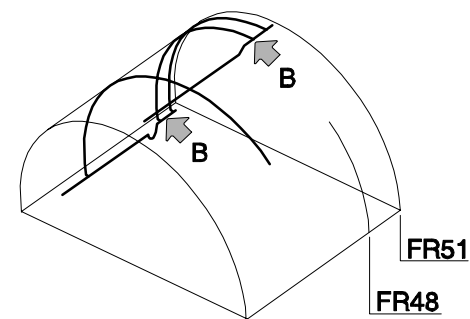
COMPONENT DESCRIPTION

The non return valves open when the emergency oxygen system is pressurized to let the oxygen flow from front to rear.

A non return valve will close if oxygen flows in the opposite direction. This will occur if the applicable supply line is damaged.



REMOVAL / INSTALLATION



REMOVAL / INSTALLATION

BLEED/VENT VALVE

FIN/ZONE

FIN : 7503WR

ZONE : 264

COMPONENT DESCRIPTION

The bleed/vent valve has two functions:

The vent function which releases the unwanted pressure in the system if there is a leak through the system shutoff valves. This makes sure that the oxygen masks will only be released when the system is operated.

The bleed function lets the system fill with oxygen before the masks are released. The valve will close again after 5 seconds.

The bleed valve is open when the supply pressure is between 3.5 and 7 bar (50 and 100 psi). It closes again after 5 seconds.

RISER LINE SHUTOFF VALVE

FIN/ZONE

FIN : 7510WR thru 7518WR

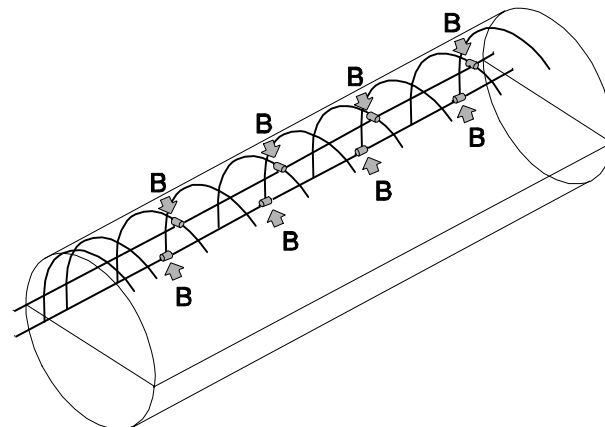
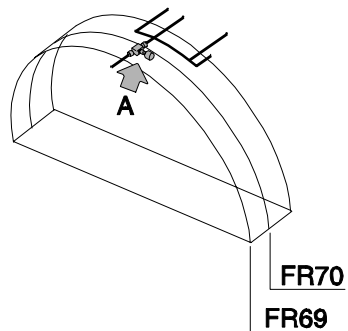
ZONE : 252, 253, 146, 254, 152

COMPONENT DESCRIPTION

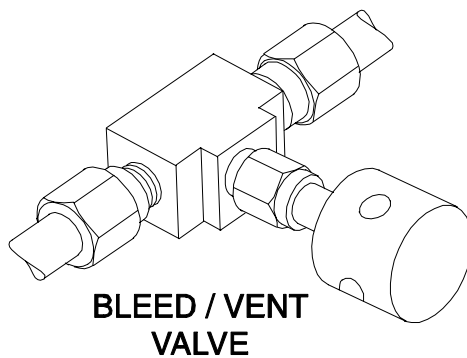
Riser line shutoff valve are installed in the engine burst area immediately after the connection with the main supply line.

In normal operation, the riser line shutoff valves are open. They are pneumatically controlled and close if the oxygen flow increases to more than 0.42 kg/min (0.92 lb/min). This prevents an oxygen flow to a damaged riser line.

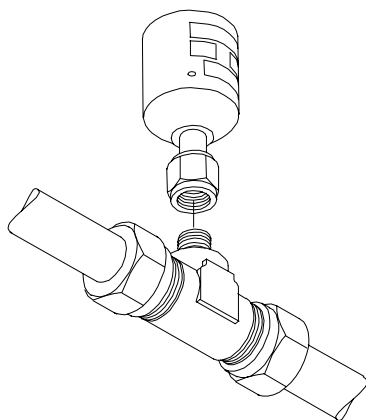
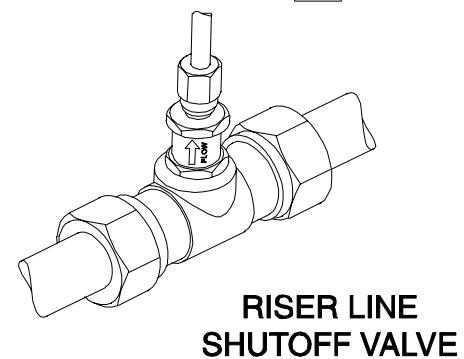
A valve will stay closed until the pressure difference across the valve is less than 1 bar (14 psi).



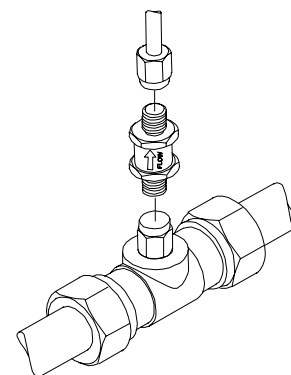
A



B



REMOVAL / INSTALLATION



REMOVAL / INSTALLATION

FQW4200 GE Metric

DIFFERENTIAL PRESSURE SWITCH

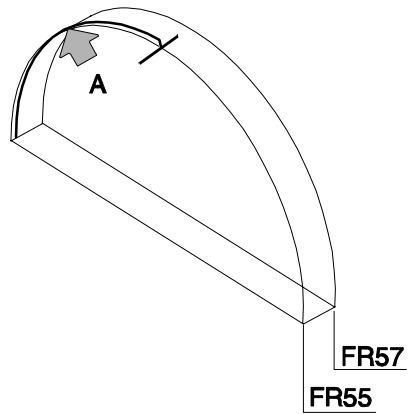
FIN/ZONE

FIN : 950WR

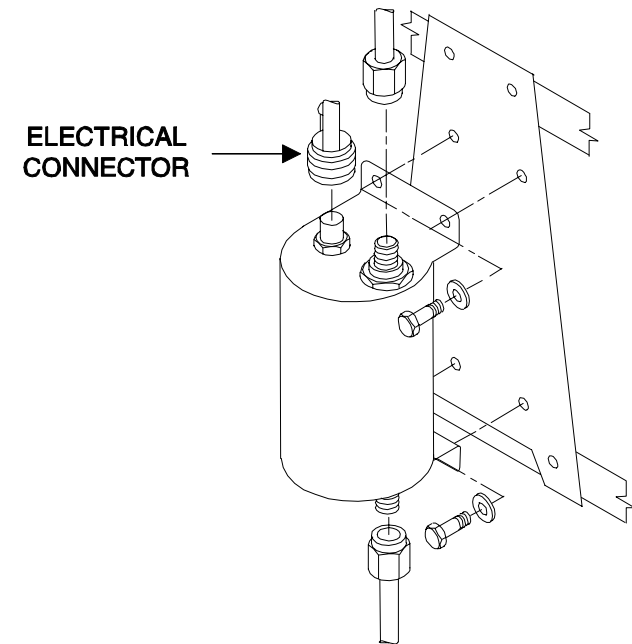
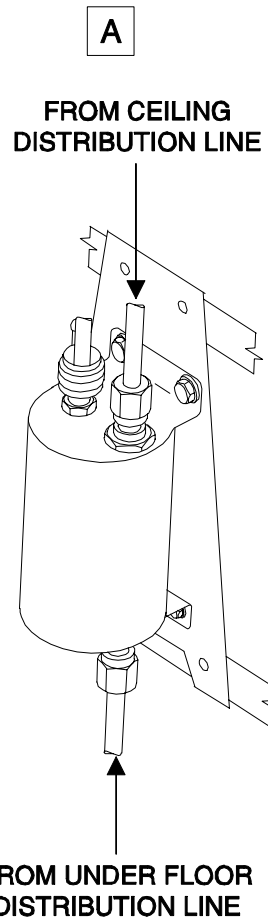
ZONE : 264

COMPONENT DESCRIPTION

The differential pressure switch compares the pressure in the two main distribution lines within the engine burst area. It is energized through the "ALERT" relays 15 seconds after system activation. If the pressure difference between the lines is more than 0.2 bar (3 psi), the applicable main distribution shutoff valve is closed.



**DIFFERENTIAL
PRESSURE
SWITCH**



REMOVAL / INSTALLATION

EMERGENCY OXYGEN CONTAINER

FIN/ZONE

FIN : 5001WR thru 5105WR

ZONE : 200

COMPONENT DESCRIPTION

The oxygen masks are stowed in the emergency oxygen containers.
As soon as the pressure in the supply lines is 3 bar (43 psi), the door latch of the container door opens.
Oxygen is supplied to each mask which is pulled down the users face.

DOOR STOR ASSEMBLY

A door stop can be pulled out and turned.
This allows the inspection and test of the emergency oxygen container door opening without the masks falling down. When the door stop is in the extended position, the word TEST and the number of the masks in the container is shown on the door stop.

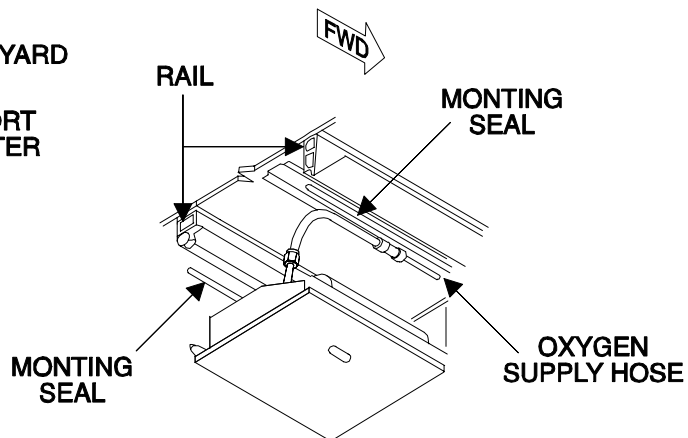
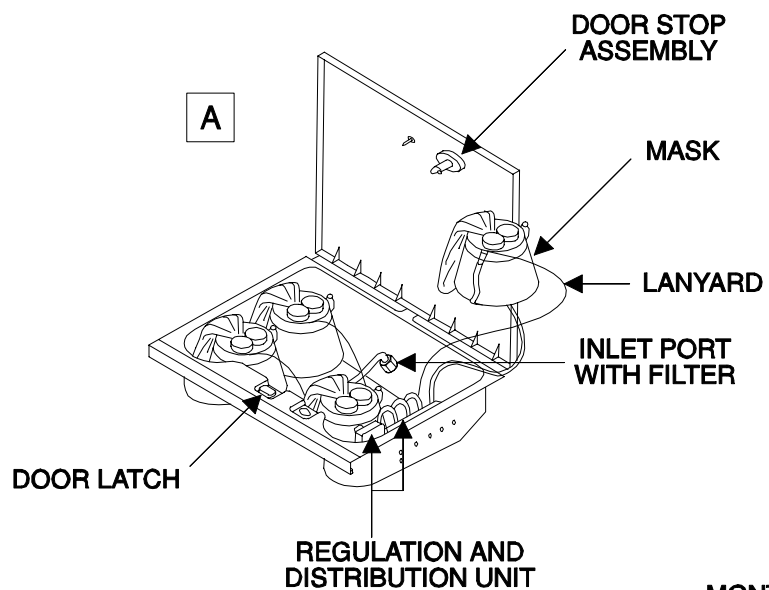
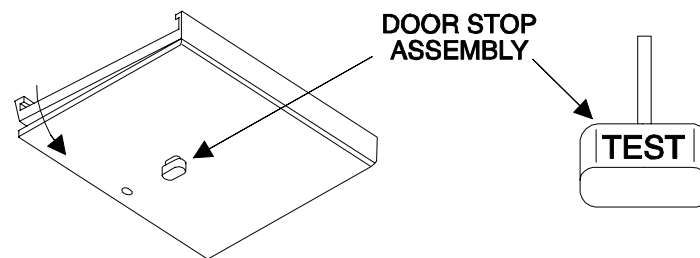
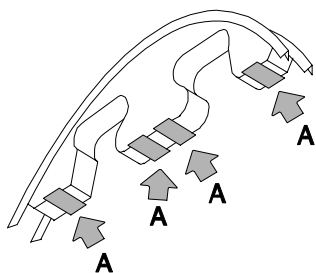
REGULATION AND DISTRIBUTION UNIT

The regulation and distribution unit supplies oxygen at the correct rate for the cabin altitude. There is an outlet port and operation mechanism for each mask. The oxygen supply to the mask is started when the release pin is pulled out by a lanyard attached to the mask.

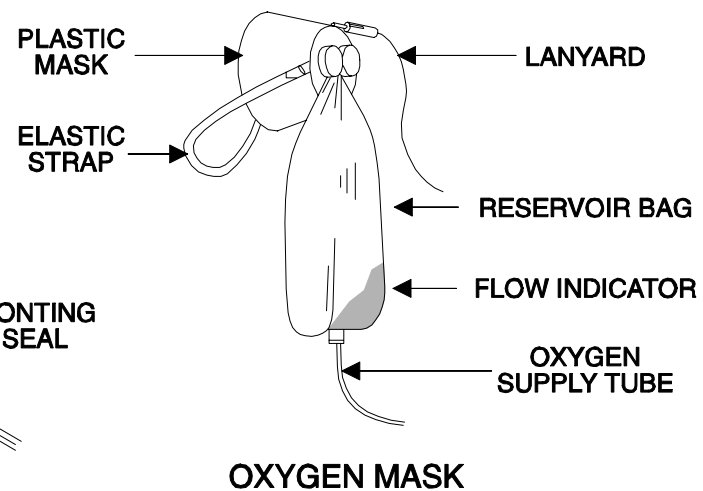
OXYGEN MASK

The continuous-flow oxygen mask is an oronasal phase-dilution type.
It has:

- a plastic mask that covers the mouth and nose,
- a reservoir bag with an illustration how to use the mask,
- an elastic strap,
- a lanyard which connects the release pin to the mask,
- an oxygen supply tube,
- a flow indicator (the green part of the reservoir bag which inflates when there is an oxygen flow).



REMOVAL / INSTALLATION



STUDENT NOTES

PASSENGER OXYGEN SYSTEM GROUND TEST

Preparation
Test Procedure
Close-Up

PREPARATION

Make sure that the corresponding circuit breakers are closed.
They are located in the avionics compartment on circuit breaker panel 742 V.U.
Energize the aircraft electrical circuits from the external power A.
On all of the emergency oxygen containers, pull out the door stops with your fingers and turn them 90 degrees to the TEST position.

TEST PROCEDURE

NOTE: During the operational test of the passenger emergency-oxygen system, the altitude switch 16 WR is not tested.

To do the operational test of the passenger emergency-oxygen system, perform the following actions:

- On panel 211 V.U., lift the switch guard and push the MAN ON pushbutton.

CAUTION: Do NOT hold the MAN ON pushbutton for more than 5 seconds.

On panel 211 V.U., the SYS ON indicator light comes on and on panel 285 V.U., the TIMER RESET switch FAULT light stays off. The emergency announcement starts via the passenger address system and the doors on all the emergency oxygen containers open to the maximum travel permitted by the door stops.

- On panel 285 V.U. push the TMR RESET pushbutton.

On panel 285 V.U., the ON indicator light on the TIMER RESET switch comes ON. On panel 211 V.U., the SYS ON indicator light goes off. The emergency announcement stops.

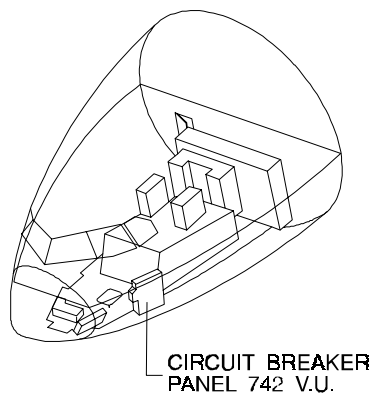
- Release the TMR RESET pushbutton.

Releasing the TIMER RESET pushbutton switches off the ON light.

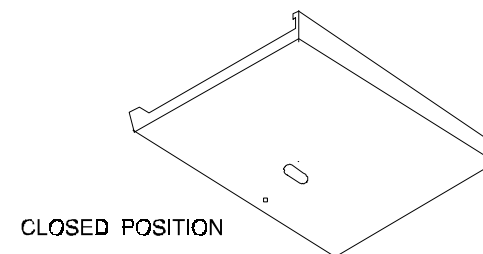
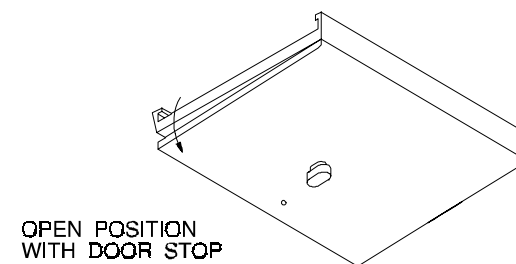
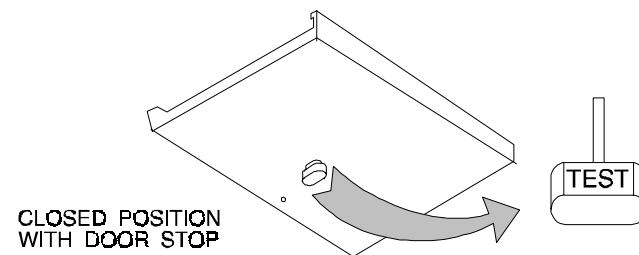
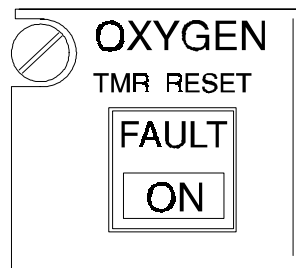
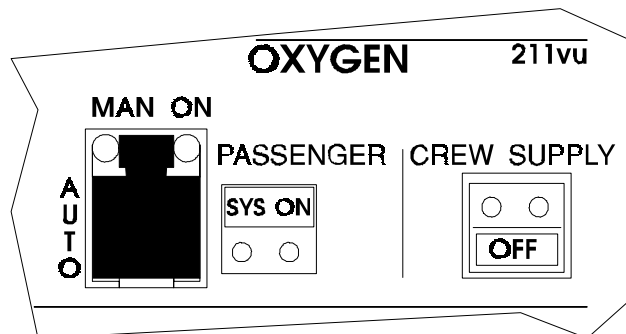
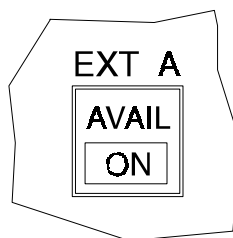
CLOSE-UP

Put the aircraft back to its initial configuration:

- Make sure that the guard is in position over the MAN ON pushbutton switch.
- Close all doors of the emergency containers. (Latches must fully engage !)
- Turn the door stops to the normal position and release them. (Spring tension retracts the door stops automatically when they are in the normal position.)
- De-energize the aircraft electrical circuits.
- Remove the ground support and all equipment, tools and other items.



ELEC PANEL



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STUDENT NOTES:

PASSENGER GASEOUS OXYGEN SYSTEM LEAKAGE TEST

Job Set-up
Leakage Test
Close-Up

JOB SET-UP

Before starting the leakage test, perform the following actions:

1. Energize the ground service network.
2. Gain access to the avionics compartment through the FWD cargo compartment door and access door 132AZ.
3. Make sure that on panel 740VU the following CB's are closed:
PAX OXY CTL (1WR, 2WR, 3WR, 4WR)
QCCU (901WR)
PAX OXY CTL & IND (900WR)
4. In the cabin, on all of the emergency oxygen containers, pull out the door stops with the correct tool and turn them 90 degrees to the TEST position.
5. In the FWD cargo compartment, remove the sidewall panel 132QW.
6. Close the manual shutoff valves oxygen cylinders.
7. On the overhead panel, lift the switch guard and push the MAN ON pushbutton switch.
8. Connect the ground service equipment:
 - Remove the cap from the test port.
 - Connect the ground pressure source to the test port.

WARNING: Clean the tools and make sure that your hands are clean to prevent contamination of the oxygen system.

LEAKAGE TEST

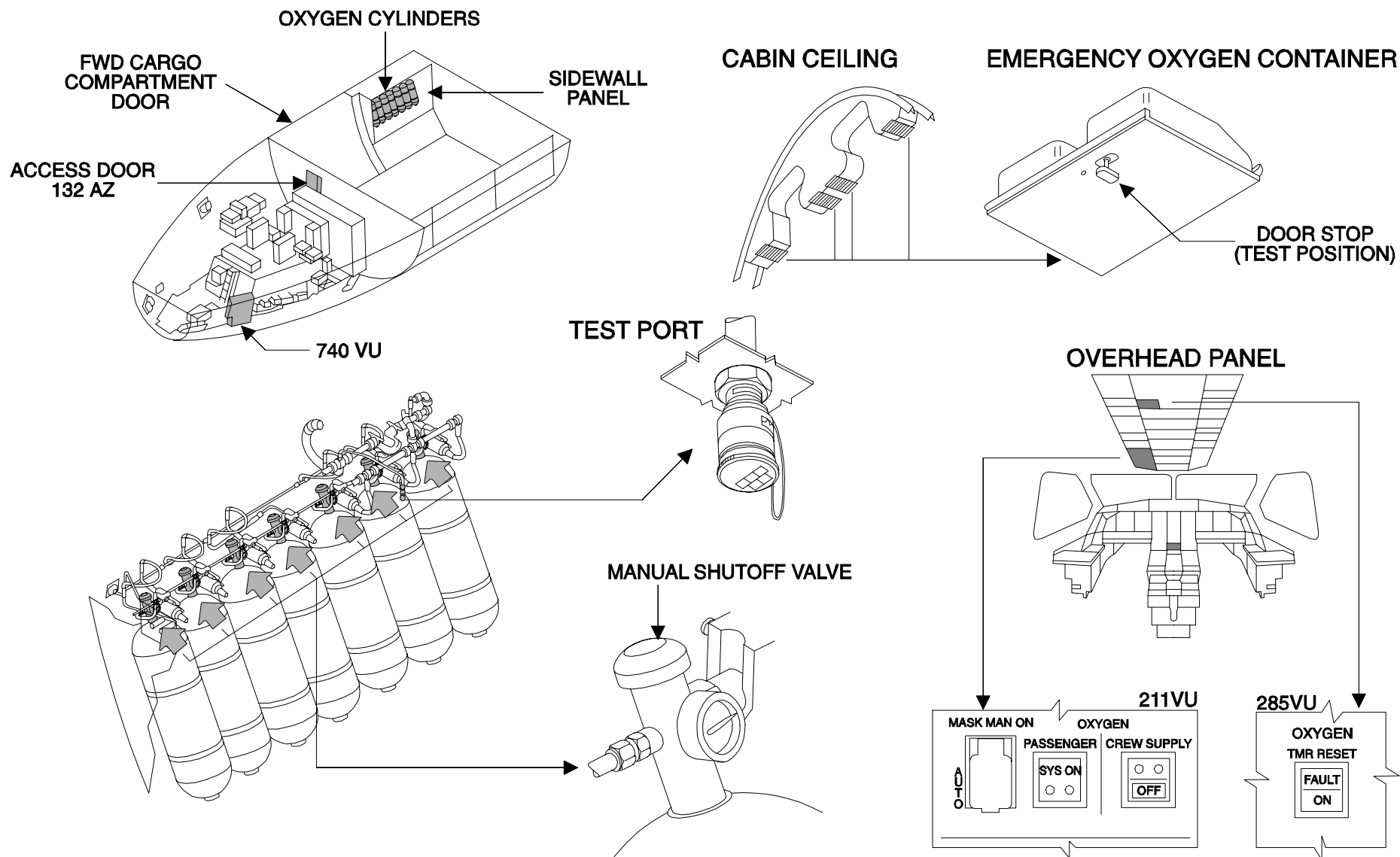
The Leakage tests contains the following steps:

1. Apply oxygen leak detector to the connections that you will examine (Ref.20-31-00).
2. Open the shutoff valve on the ground pressure source until the system pressure is stable at 10.5 bar (152 psi).
3. Check the connections for leaks.
NOTE: Leaks are NOT permitted.
4. Release the pressure from the system.
5. Clean the examined connections.

CLOSE-UP

After the leakage test, leave the aircraft in the original configuration:

1. Disconnect the ground pressure source from the test port.
2. On the overhead panel, push the RESET pushbutton switch.
3. In the cabin, close all the doors of the emergency oxygen containers.
NOTE : Make sure that the latches engage.
4. Turn the door stops to the normal position.
NOTE: Spring tension will retract the door stops when they are in the normal position.
5. On the overhead panel, make sure that the switch guard is in position over the MAN ON pushbutton.
6. Open the manual shutoff valves on the oxygen cylinders.
7. Make sure that the work area is clean and clear of tools and other items.
8. In the FWD cargo compartment, install sidewall panel 132QW.
9. Close the access door 132AZ and close the FWD cargo compartment door.
10. De-energize the ground service network.



STUDENT NOTES

FLIGHT CREW PORTABLE OXYGEN SYSTEM DESCRIPTION

General
Location
Description

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GENERAL

The flight crew protective breathing equipment protects the eyes and respiratory system. It supplies oxygen if there is a fire or an emission of smoke and noxious gas.

This protective breathing equipment allows freedom of movement to extinguish a fire. It can also supply emergency-oxygen if the fixed emergency-oxygen system does not work.

LOCATION

The protective breathing equipment is installed in the cockpit in the left lateral panel.

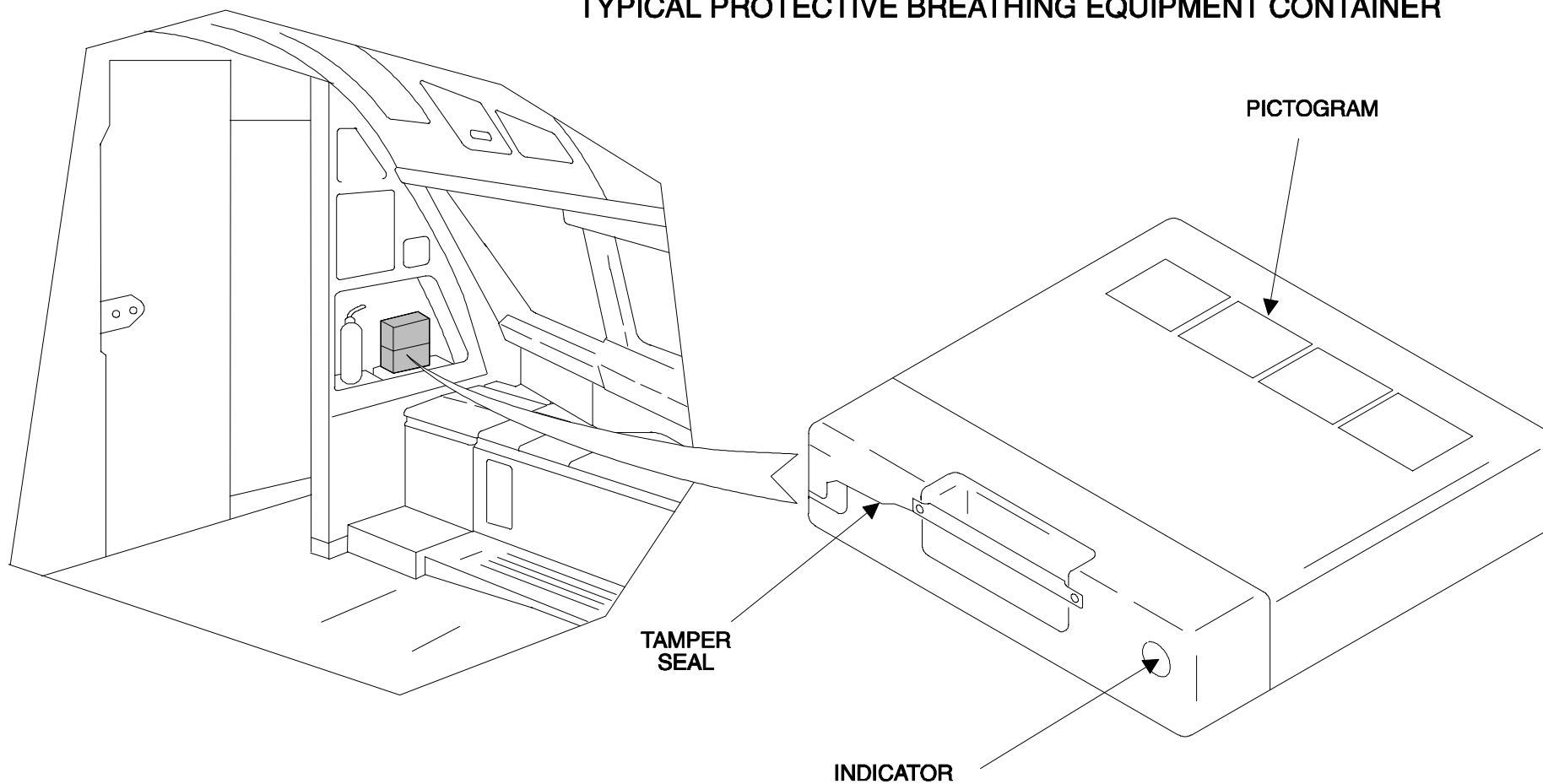
It is vacuum packed in a transport/storage container.

DESCRIPTION

The container is provided with a good-condition indicator and a tamper seal, used for preflight inspection. When the indicator does not show the operational colour or when the tamper seal is broken, the breathing equipment should be replaced.

A pictogram on the container describes its utilization procedure.
The identification plate, located at the back of the container shows the date of its manufacture.

TYPICAL PROTECTIVE BREATHING EQUIPMENT CONTAINER



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STUDENT NOTES:

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CABIN ATTENDANTS PORTABLE OXYGEN DESCRIPTION AND OPERATION

Location
Protective Breathing Equipment
Oxygen Cylinder

The cabin attendants portable oxygen system supplies oxygen to the cabin attendants. It also supplies first aid oxygen for the passengers.

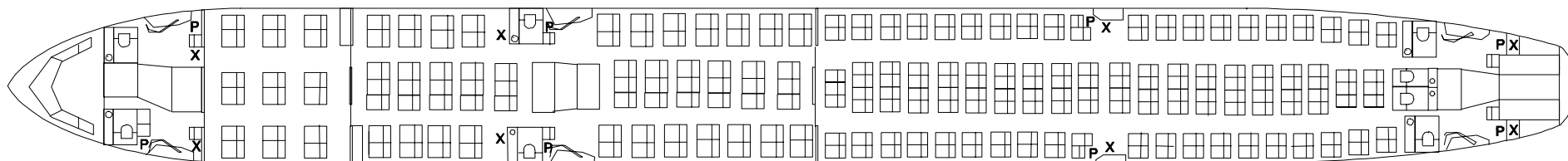
LOCATION

The cabin attendants portable oxygen devices are located at the cabin attendant stations and in several locations in the cabin. They are immediately available to the cabin attendants.

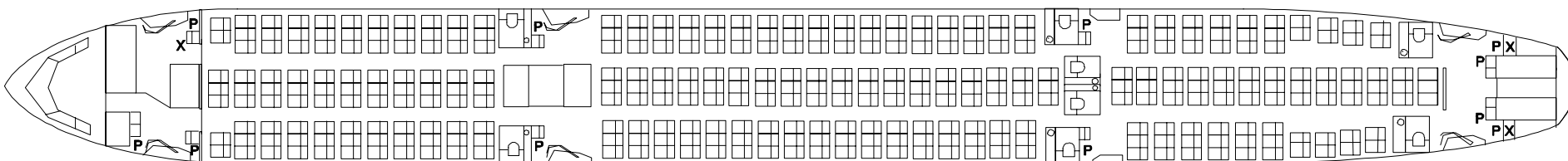
The cabin attendants portable oxygen system comprises :

- high pressure oxygen cylinders with continuous flow type masks,
- protective breathing equipment.

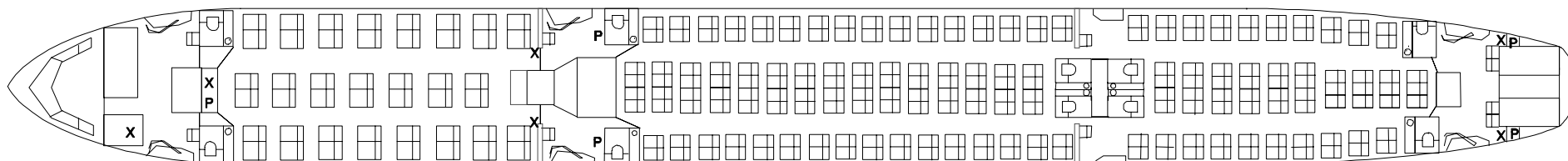
TYPICAL 3 CLASS LAYOUT



TYPICAL ALL TOURIST CLASS LAYOUT



TYPICAL 2 CLASS LAYOUT



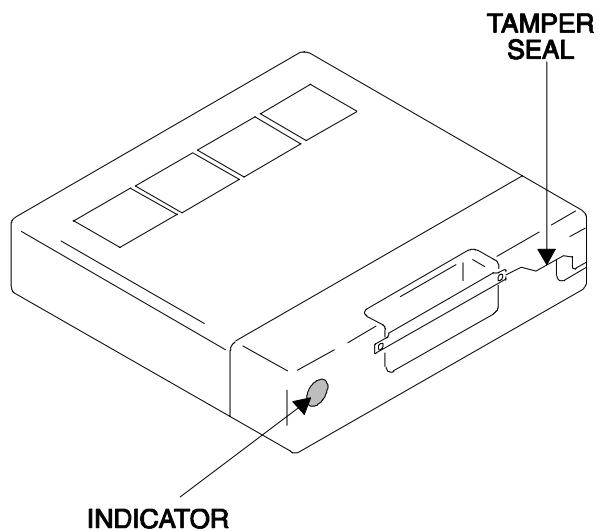
P = protective breathing equipment
X = oxygen cylinder

PROTECTIVE BREATHING EQUIPMENT

The protective breathing equipment is similar to the breathing hood installed in the cockpit.

It is installed in several locations in the cabin. The primary use, is to supply oxygen to the cabin attendants if there is a fire or an emission of smoke and/or noxious gas. It enables the cabin attendants to move freely through the cabin.

TYPICAL PROTECTIVE BREATHING EQUIPMENT



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OXYGEN CYLINDER

The typical oxygen source is a high pressure cylinder with a capacity of 310 l (11 cubic ft) Normal Temperature Pressure Dry (NTPD) at a pressure of 1800 psi (124 bar).

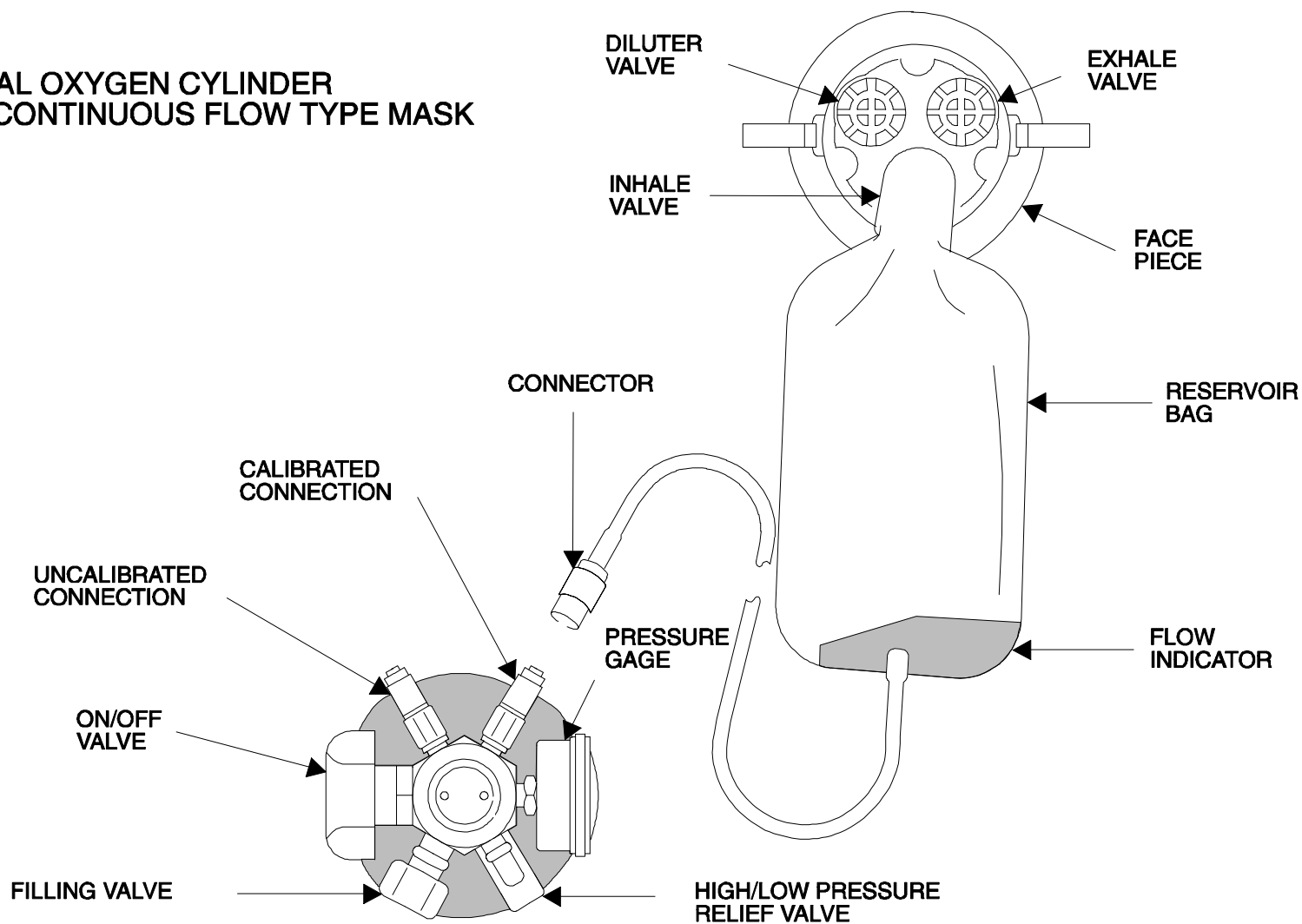
A pressure regulator reduces the pressure between 35 psi (2.4 bar) and 86 psi (6 bar) to supply the mask with a constant flow outlet.

A high pressure relief valve with a rupture disk protects the cylinder from overpressure. The disk breaks at a pressure of 2700 psi (186bar).

The low pressure side of the regulator is protected by a low pressure relief valve. The valve opens when the outlet pressure is more than 90 psi (6.2 bar), to release the oxygen.

The pressure in the cylinder can be checked on the direct-reading pressure gage.

TYPICAL OXYGEN CYLINDER WITH CONTINUOUS FLOW TYPE MASK



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STUDENT NOTES

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OXYGEN CYLINDER REMOVAL/INSTALLATION - ONE BOTTLE

- Removal Warning
- Removal Job Setup
- Removal Procedure
- Installation Warning and Precaution
- Installation Procedure
- Leak Test
- Close-Up

REMOVAL WARNING

Before starting the removal procedure of the oxygen cylinder, take care of the following items.

- Keep all hydrocarbons (fuels, lubricants, etc.) away from all sources of oxygen because oxygen becomes explosive when it touches hydrocarbons.
- Clean the tools and make sure that your hands are clean to prevent contamination of the oxygen system.

REMOVAL JOB SETUP

Energize the ground service network in the forward cabin ceiling. Then put a platform in front of access door 811 and open this door to get access to the oxygen cradle. Open the cradle and close the manual ON/OFF valve. On panel 742 V.U. , open safety and tag the crew oxygen control circuit breaker. In the cockpit, energize the aircraft electrical circuits on the ELEC panel. Then, bleed the oxygen system by pushing the CREW supply pushbutton on the OXYGEN panel (the OFF legend goes off). Now operate the PRESS TO TEST AND RESET several times to empty the system. Finally, release the CREW supply pushbutton (OFF legend comes on).

REMOVAL PROCEDURE

Disconnect the pressure regulator/transmitter from the cylinder valve by loosening the nut. Put a blanking cap on the regulator/transmitter and put it in a sealed vinyl bag. Put an oxygen cylinder stowage cap on the cylinder valve.

The second step is to disconnect the High Pressure oxygen overpressure hose from the cylinder valve and to discard the conical seal.

Put a blanking cap on the hose and an oxygen cylinder stowage cap on the cylinder valve.

To remove the cylinder, loosen and open the two straps.

INSTALLATION WARNING AND PRECAUTION

Before starting the installation procedure, be sure that the ground service network is energized and that the crew oxygen control circuit breaker is open, safetied and tagged. Make also sure that the access platform is in position at door 811 and that this door is opened. Check the expiry date on the cylinder to make sure that the cylinder still can be used. Only use OXYGEN SYSTEM LUBRICANT on the thread of the nut or on the flared portion of the tube. Apply only a thin layer of the compound on the first three of the male threads.

INSTALLATION PROCEDURE

The installation procedure starts by placing the cylinder on the support in the straps. Then remove the stowage cap from the cylinder valve and the blanking cap from the High Pressure oxygen overpressure hose.

Put a new conical seal on the HP oxygen overpressure hose and tighten the hose on the cylinder.

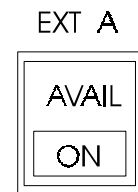
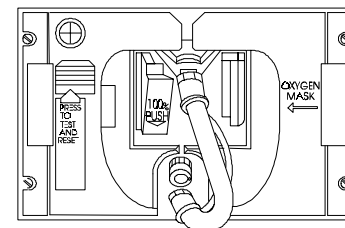
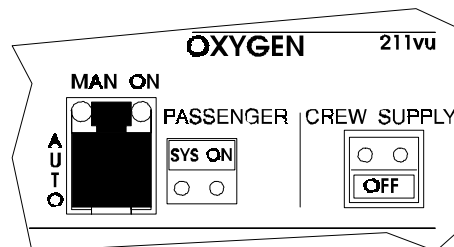
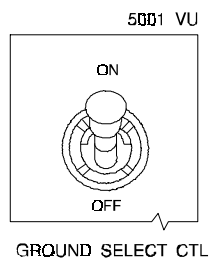
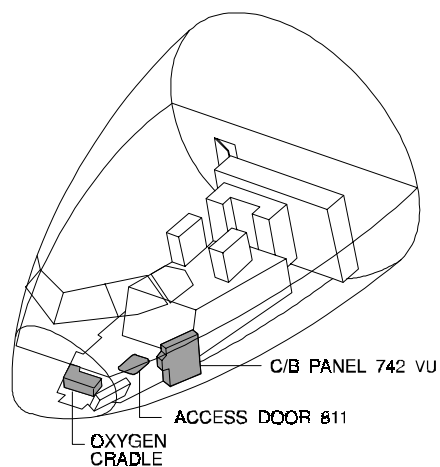
The final step is to connect the regulator/transmitter. Remove the blanking cap from the pressure regulator/transmitter and remove the oxygen cylinder stowage cap from the cylinder valve. Put the pressure regulator/transmitter on the valve and tighten the nut.

LEAK TEST

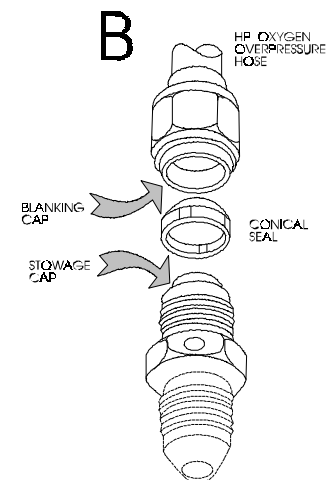
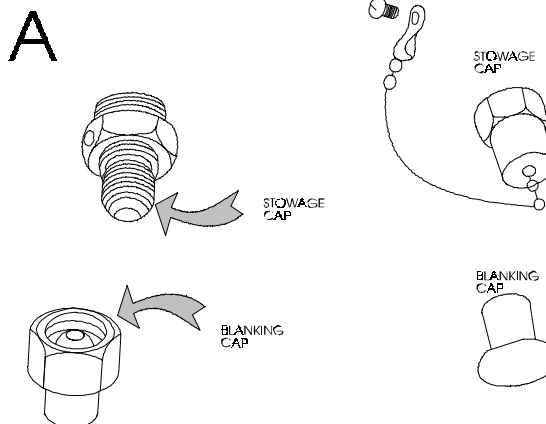
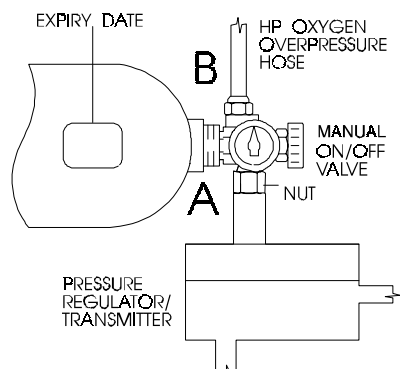
Apply the solution OXYGEN LEAK DETECTOR to the mechanical connections. Then slowly open the manual ON/OFF valve 3 to 4 turns and let the pressure become stable (after 90 seconds). Then fully open the ON/OFF valve and examine each connection to make sure that there are no leaks. Finally remove the solution OXYGEN LEAK DETECTOR.

CLOSE-UP

To finish the procedure, remove the safety clip and tag and close the circuit breaker. Make sure that the work area is clean and clear of tools and other items. Then close the oxygen cradle. De-energize the aircraft electrical circuits. Close the access door 811 and remove the platform.



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STUDENT NOTES:

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OXYGEN CYLINDER REMOVAL/INSTALLATION - TWO BOTTLES

- Removal Warning
- Removal Job Setup
- Removal Procedure
- Installation Warning and Precaution
- Installation Procedure
- Leak Test
- Close-Up

REMOVAL WARNING

Before starting the removal procedure of the oxygen cylinders, take care of the following items.

- Keep all hydrocarbons (fuels, lubricants, etc.) away from all sources of oxygen because oxygen becomes explosive when it touches hydrocarbons.
- Clean the tools and make sure that your hands are clean to prevent contamination of the oxygen system.

REMOVAL JOB SETUP

Put an access platform in front of access door 811 and open this door to get access to the oxygen cradle.

Then energize the ground service network in the forward cabin ceiling.

Open the cradle and close the manual ON/OFF valves.

Energize the aircraft electrical circuits.

Then, bleed the oxygen system by pushing the CREW supply pushbutton switch on the OXYGEN panel (the OFF legend goes off). Operate the PRESS TO TEST AND RESET slide on one of the oxygen masks several times to empty the system.

Release the CREW supply pushbutton switch (OFF legend comes on).

Put a warning notice on panel 211 VU to tell persons not to press the CREW supply pushbutton switch.

Finally open, safety and tag the crew oxygen control circuit breaker.

REMOVAL PROCEDURE

Disconnect the pressure regulator/transmitters from the cylinder valves by loosening the nuts. Put blanking caps on the regulator/transmitters and put them in sealed vinyl bags. Put oxygen cylinder stowage caps on the cylinder valves.

The second step is to disconnect the High Pressure oxygen overpressure hose from the cylinder valves.

Put blanking caps on the hoses and oxygen cylinder stowage caps on the cylinder valves.

To remove the cylinders, loosen and open the straps.

INSTALLATION WARNING AND PRECAUTION

Before starting the installation procedure, be sure that the ground service network is energized and that the crew oxygen control circuit breaker is open, safetied and tagged. Make also sure that the access platform is in position at door 811 and that this door is open. On panel 211 VU, make sure that the warning notice is in position. Check the expiry date on the cylinders to make sure that the cylinders still can be used. Only use OXYGEN SYSTEM LUBRICANT on the thread of the nut or on the flared portion of the tube. Apply only a thin layer of the compound on the first three of the male threads.

INSTALLATION PROCEDURE

The installation procedure starts by placing the cylinders on the supports in the straps. Then remove the stowage caps from the cylinder valves and the blanking caps from the High Pressure oxygen overpressure hoses.

Tighten the hoses on the cylinders.

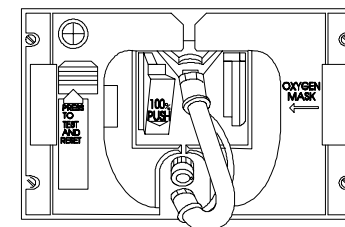
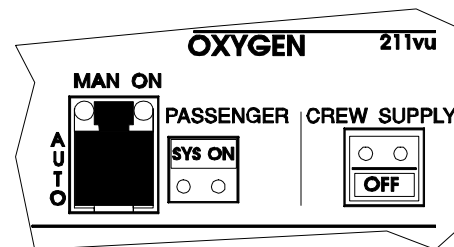
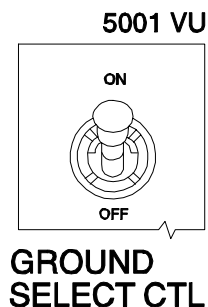
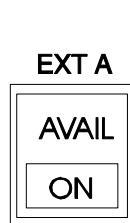
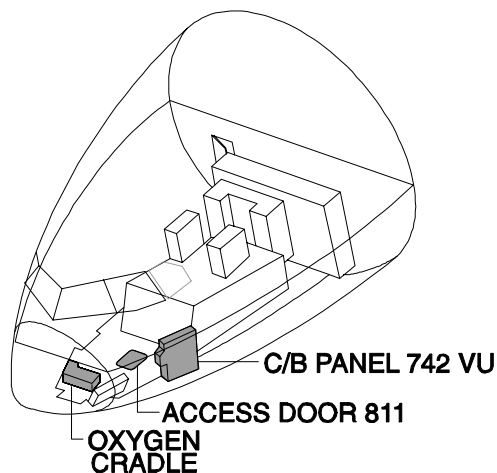
The final step is to connect the regulator/transmitters. Remove the blanking caps from the pressure regulator/transmitters and remove the oxygen cylinder stowage caps from the cylinder valves. Put the pressure regulator/transmitters on the valves and tighten the nuts.

LEAK TEST

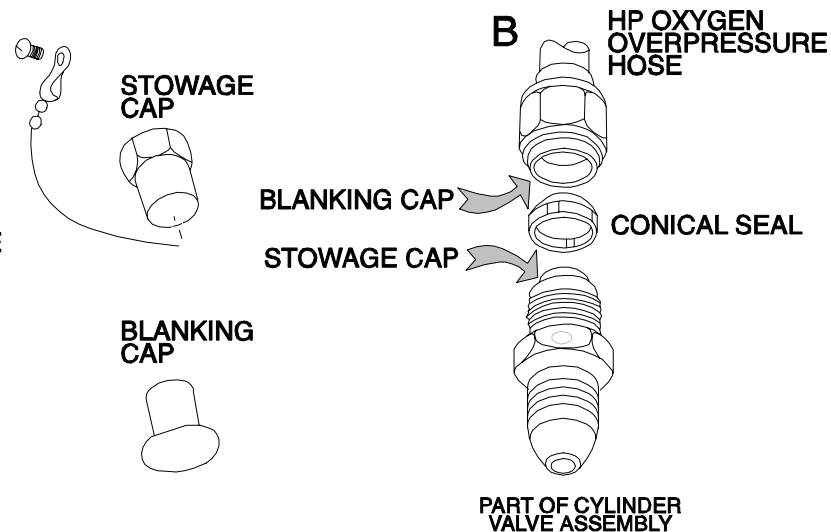
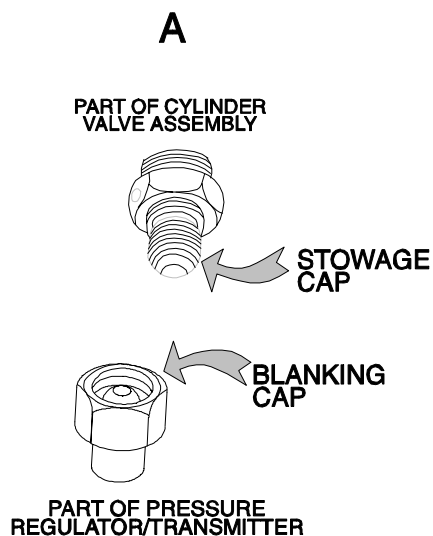
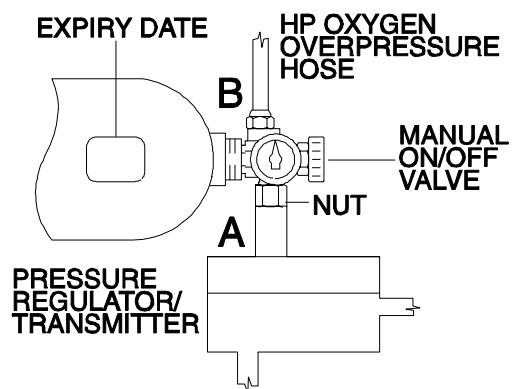
Apply the solution OXYGEN LEAK DETECTOR to the mechanical connections. Then slowly open the manual ON/OFF valves 3 to 4 turns and let the pressure become stable (after 90 seconds). Then fully open the ON/OFF valves and examine each connection to make sure that there are no leaks. Finally remove the solution OXYGEN LEAK DETECTOR.

CLOSE-UP

To finish the procedure, remove the safety clip and tag and close the circuit breaker. Make sure that the work area is clean and clear of tools and other items. Remove the warning notice. Then close the oxygen cradle. De-energize the aircraft electrical circuits. De-energize the ground service network. Close the access door 811 and remove the platform.



CYLINDER VALVE ASSEMBLY



Note: follow the same steps to remove the second cylinder.

STUDENT NOTES:

PASSENGER GASEOUS OXYGEN SYSTEM CYLINDERS FILLING

Warnings/Precautions
Job Set-up
Maintenance Configuration
Filling
Close-up

WARNINGS / PRECAUTIONS

During the filling procedure, obey these warnings and precautions:

- Prevent all maintenance procedures on the aircraft (refueling, repair of fuel and hydraulic systems, use of flammable materials, and connection/disconnection of the ground power connector).
- Make sure there is no smoking or flame in a radius of 20 m (66 ft) of the replenishing equipment.
- Use only the equipment which is specially for the oxygen system.
- Clean the tools and the ground servicing equipment and make sure that your hands are clean to prevent contamination of the oxygen system and the ground servicing equipment.
- Carefully obey the replenishing instructions given on the aircraft placards. If you do not obey this instructions, you can cause a fire or an explosion.
- Only persons necessary for this procedure are permitted in the aircraft during the task.

Note: Always obey the special precautions when working on the oxygen system (task 35-00-00-860-801).

JOB SETUP

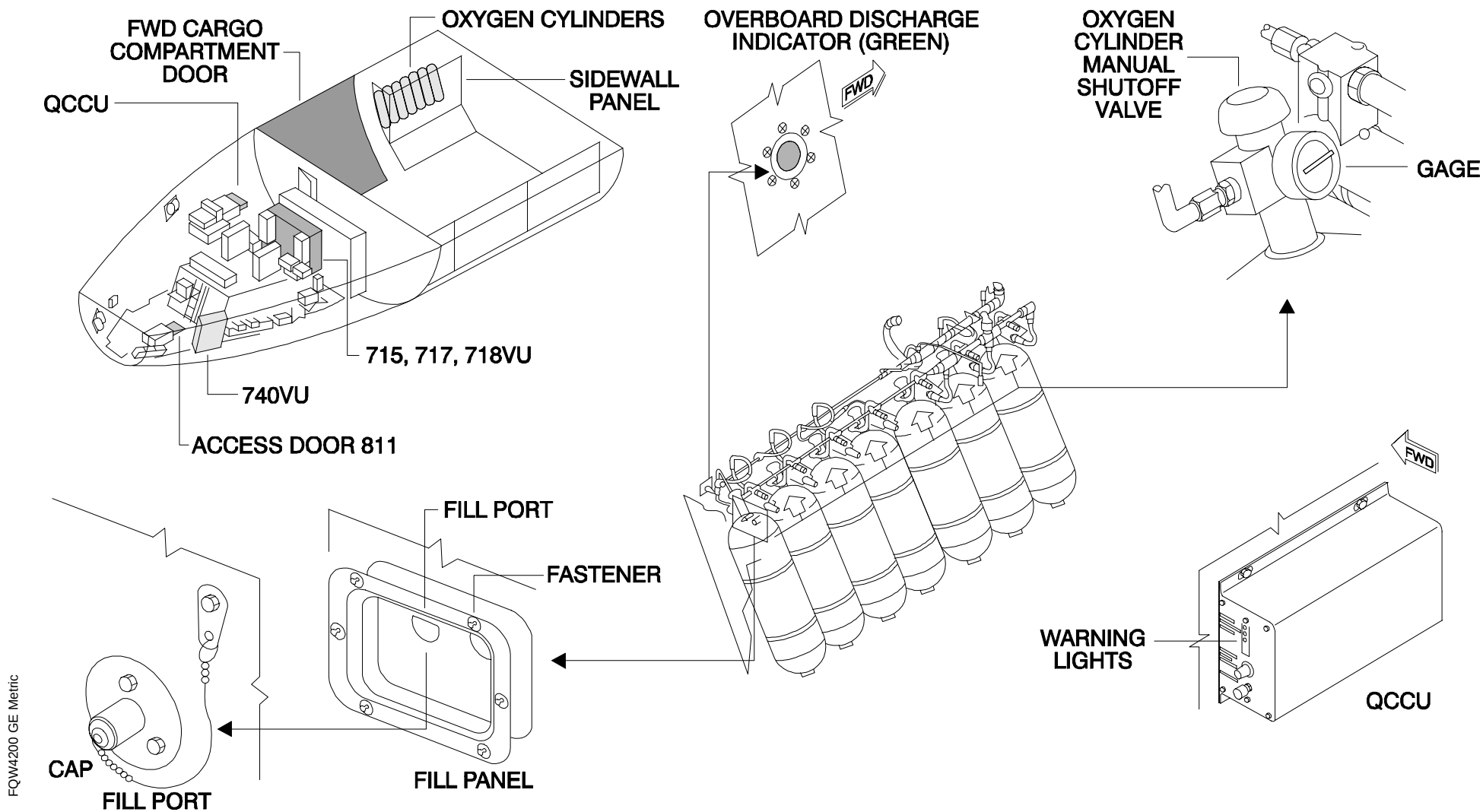
Before starting the filling procedure perform the following actions:

- 1 - Energize the ground service network.
- 2 - Get access to the avionics compartment through access door 811.
- 3 - Put a warning notice in the cockpit and in the work area to tell that the filling operation is dangerous and not to operate the oxygen system.
- 4 - Make sure that on panel 740VU the following CB's are closed:
 - PAX OXY CTL (1WR, 2WR, 3WR, 4WR)
 - QCCU (901WR)
 - PAX OXY CTL & IND (900WR)
- 5 - Open the following CB's on panel 715VU, 717VU and 718VU:
 - GALLEY AFT (12MC, 24MC, 224MC)
 - GALLEY FWD MID (23MC, 11MC, 111MC)
 - GALLEY FWD MID AFT (112MC, 223MC)
- 6 - Get access to the oxygen cylinders through the FWD cargo compartment door by removing the side wallpanel (132QW).
- 7 - Disconnect the fasteners and remove the cover of the filling panel.

MAINTENANCE CONFIGURATION

Before starting the filling procedure, check the following:

- 1 - Make sure that the overboard discharge indicators shows green.
- 2 - Make sure that the date of the test given on the oxygen cylinders is in the permitted time limit.
- 3 - Make sure that the manual shutoff valves on the oxygen cylinders are open.
- 4 - Make sure that the number of oxygen cylinders set on the QCCU is the same as the number installed on the aircraft.
- 5 - Make sure that the warning lights on the QCCU are off.



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FILLING

These are the steps of the filling procedure:

- 1 - Put the oxygen ground-filling equipment in position.
- 2 - Connect an electrostatic ground between the oxygen ground-filling equipment and the aircraft.
- 3 - Remove the cap from the fill port and connect the oxygen ground-filling equipment.
- 4 - Measure the outside temperature (AOT) and the cargo compartment temperature with a thermometer.
- 5 - Refer to the aircraft placards to find the correct filling pressure.

Fill the cylinders with oxygen (MIL-0 27210):

- 6 - Open the shutoff valve on the oxygen ground-filling equipment (the pressure shown must not increase by more than 200 Psi (14 bar) in a minute).

- 7 - Check on the gages on the oxygen cylinders that the pressures increase smoothly together.

Warning: Stop the filling procedure immediately if the pressures do not increase smoothly together.

- 8 - Calculate the average pressure in the oxygen cylinders (sum of the pressures divided by the number of cylinders) and make sure that the pressure shown on the fill panel indicator is the same as the calculated average pressure.

- 9 - As soon as the correct pressure is reached, close the shutoff valve of the oxygen ground-filling equipment.

Note: The pressure must not be more than 10% above the indicated value.

- 10 - Slowly disconnect the oxygen ground-filling equipment and install the cap on the fill port.
- 11 - Disconnect the electrostatic ground.

CLOSE-UP

After the filling procedure, leave the aircraft in the original configuration.

- 1 - Put the cover of the fill panel in position and tighten the fasteners.
- 2 - Install the sidewall panel (132QW).
- 3 - Make sure that the work area is clean and clear of tools and other items.
- 4 - Close the FWD cargo compartment door.
- 5 - Remove the safety clips and tags and close the CB's on panel 715, 717 and 718VU:
 - GALLEY AFT (12MC, 24MC, 224MC)
 - GALLEY FWD MID (23MC, 11MC, 111MC)
 - GALLEY FWD MID AFT (112MC, 223MC)
- 6 - Close access door 811 and remove the access platform.
- 7 - Remove the warning notices.
- 8 - De-energize the ground service network.