Aerolineas Argentinas

PAGE	DATE	CODE
CHAPTER 35 TAB		
OXYGEN		
EFFECTIVE PAGES		
SEE LAST PAGE OF LIST		
FOR NUMBER OF PAGES		
35-CONTENTS		
R 1	AUG 01/07	ARG.1
R 2	AUG 01/07	ARG.1
R 3	AUG 01/07	ARG.1
4	BLANK	
35-00-00		
1	AUG 01/05	06
2	AUG 01/05	17
3	AUG 01/05	17
4	AUG 01/05	17
5	AUG 01/05	09
6	AUG 01/05	04
35-00-00		
R 201	AUG 01/07	01.1
R 202	AUG 01/07	01.1
R 203	AUG 01/07	01.1
R 204	AUG 01/07	01.1
R 205	AUG 01/07	05.1
R 206	AUG 01/07	03.1
R 207	AUG 01/07	03.1
R 208	AUG 01/07	03.1
R 209	AUG 01/07	03.1
210	AUG 01/05	01
35-00-00		
301	AUG 01/05	04
302	BLANK	
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701	AUG 01/05	01
702	BLANK	
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2	DEC 01/04	01
35-09-100		
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402	AUG 01/05	01
403	DEC 01/04	13
404	BLANK	
35-09-100		
501	DEC 01/04	01
502	BLANK	
35-09-100		
701	DEC 01/04	01
702	BLANK	
35-09-200		
401	AUG 01/05	06
402	AUG 01/05	07
403	DEC 01/04	03
404	BLANK	
35-09-201		
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402	DEC 01/04	06
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35-09-300		
401	DEC 01/04	01
402	DEC 01/04	01
35-09-311		
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202	DEC 01/04	01
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2	DEC 01/04	13
3	DEC 01/04	18
4	DEC 01/04	19
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6	DEC 01/04	07
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8	DEC 01/04	18
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202	BLANK	

Aerolineas Argentinas

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R 503	AUG 01/07	01.1
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35-31-0		
601	AUG 01/05	01
602	BLANK	
35-31-0		
701	DEC 01/04	01
702	BLANK	

CHAPTER 35 - OXYGEN

TABLE OF CONTENTS

CHAPTER 35 - OXYGEN

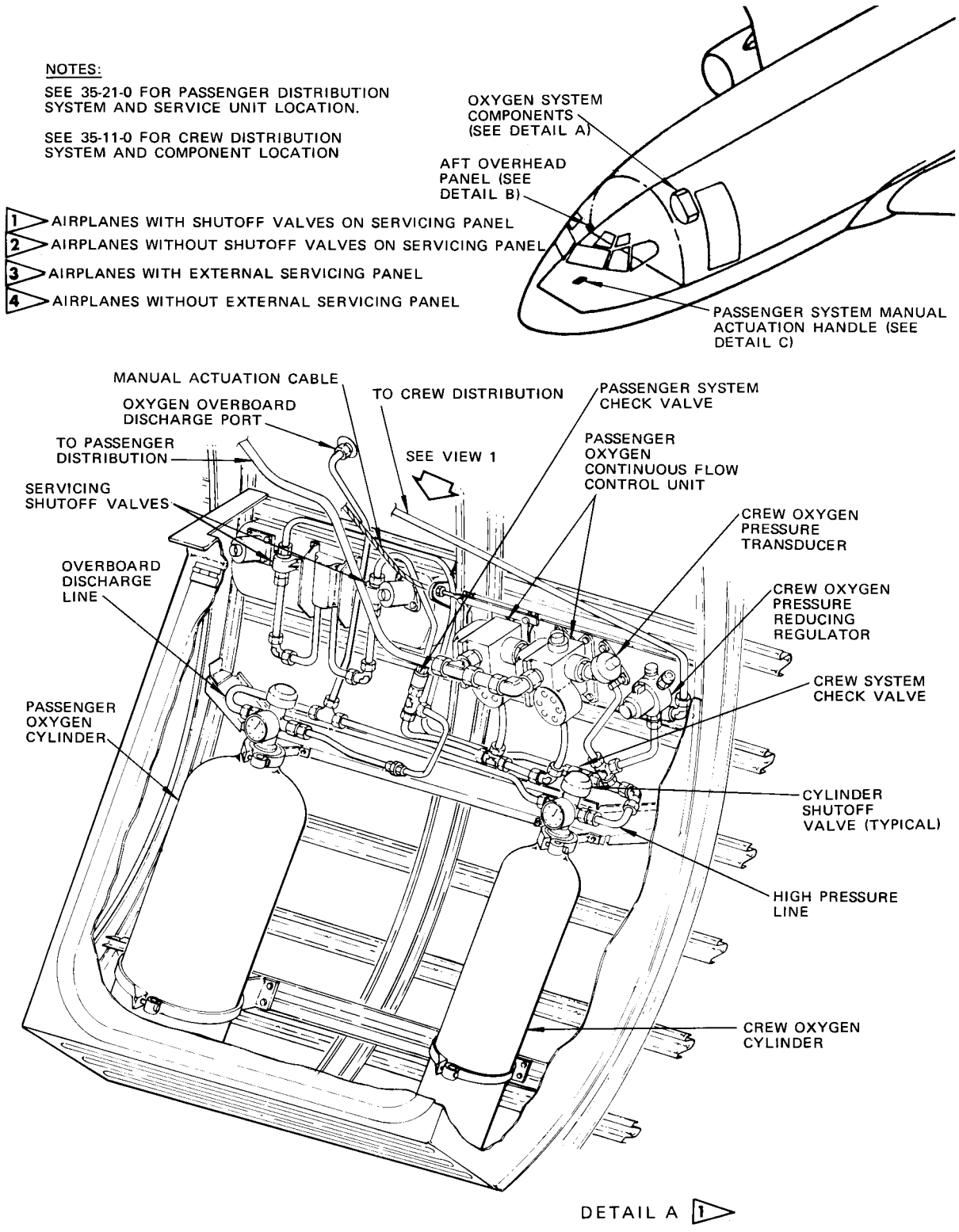
TABLE OF CONTENTS

CHAPTER 35 - OXYGEN

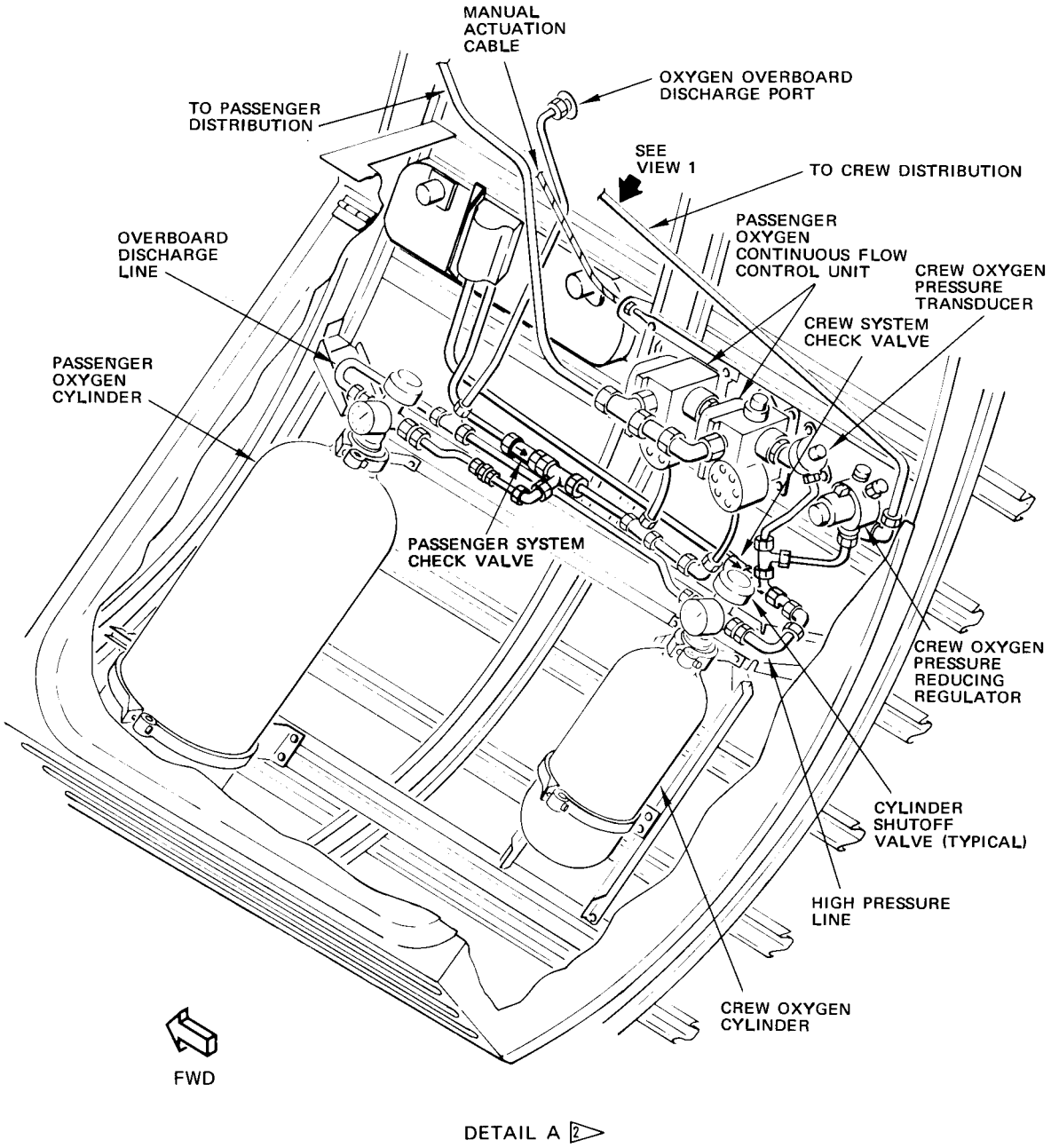
TABLE OF CONTENTS

OXYGEN SYSTEMS - DESCRIPTION AND OPERATION

1. General
   A. The oxygen systems provide storage of high pressure gaseous oxygen and distribution and delivery of low pressure oxygen to the crew and passengers (Fig. 1). High pressure oxygen is stored in oxygen cylinders which can be replaced with fully serviced cylinders or (on airplanes so equipped) refilled through an external servicing panel. Each oxygen cylinder assembly has a safety relief valve for protection against excessive pressure.
   B. The oxygen high pressure is reduced for distribution to crew and passenger outlets (Fig. 2).
   C. Two oxygen systems are provided: the flight crew oxygen system and the passenger oxygen system. They are connected through the filler valve (on airplanes so equipped), but there are no cross connections downstream of the cylinders. A third oxygen supply is provided by portable oxygen cylinder assemblies.
      (1) In the crew system the oxygen cylinder high pressure is reduced, first by a pressure reducing regulator, then further reduced to using pressure by the diluter demand regulators. The low pressure oxygen is distributed from the individual crewmember's diluter demand regulator through a flexible hose and an oxygen mask to the crewmember.
      (2) The passenger oxygen system automatically supplies oxygen to the passengers and attendants whenever the cabin pressure drops to a pressure equivalent to an altitude of 14,000 feet or higher. System activation, pressure reduction, and flow control are effected automatically by two continuous flow control units. The system can also be activated electrically by a switch on the aft overhead panel or manually by a handle located in a recess in the control cabin floor.
      (3) Portable oxygen cylinder assemblies located in the passenger cabin, and the control cabin, provide oxygen for first aid and walk-around use.



Oxygen System Component Location
Figure 1 (Sheet 1)



Oxygen System Component Location
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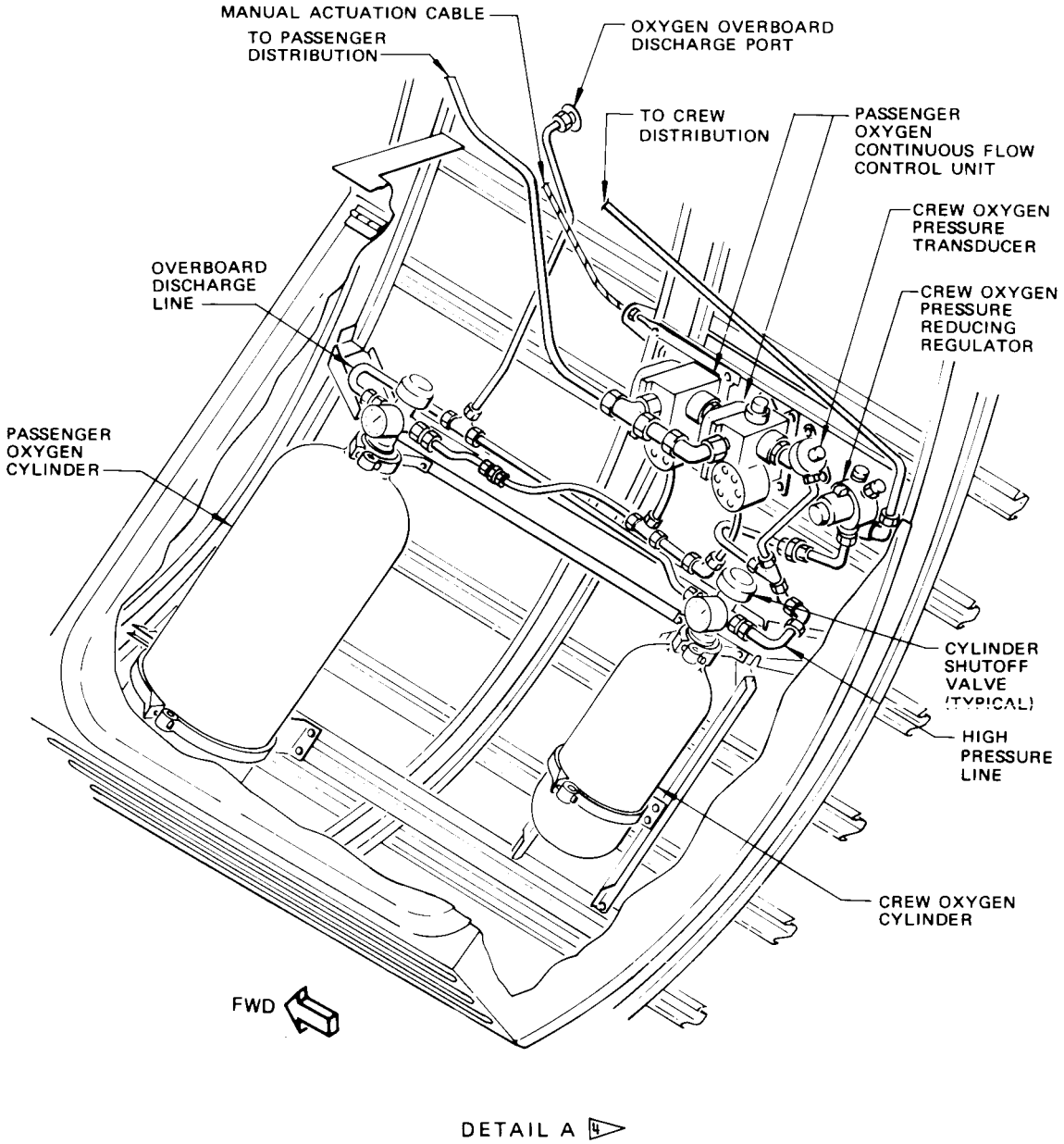

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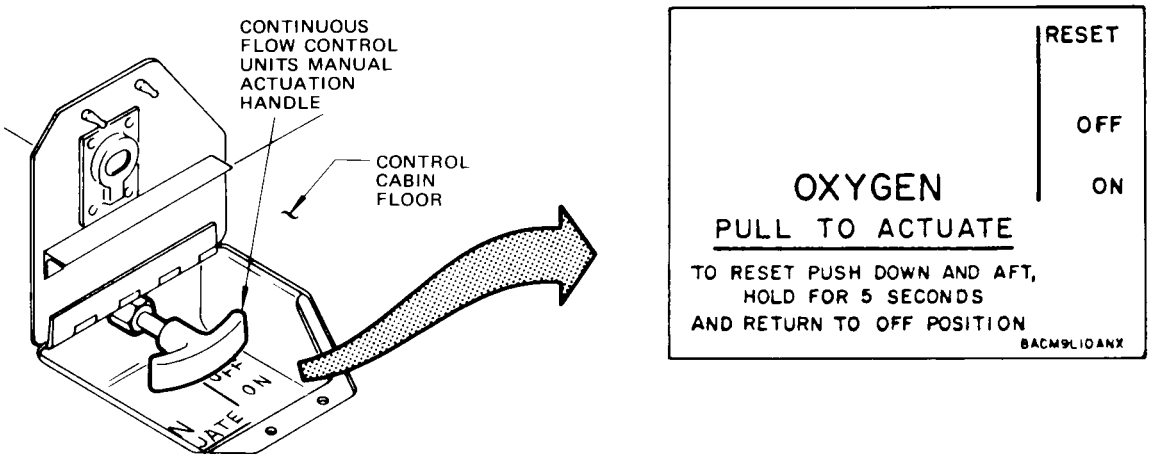
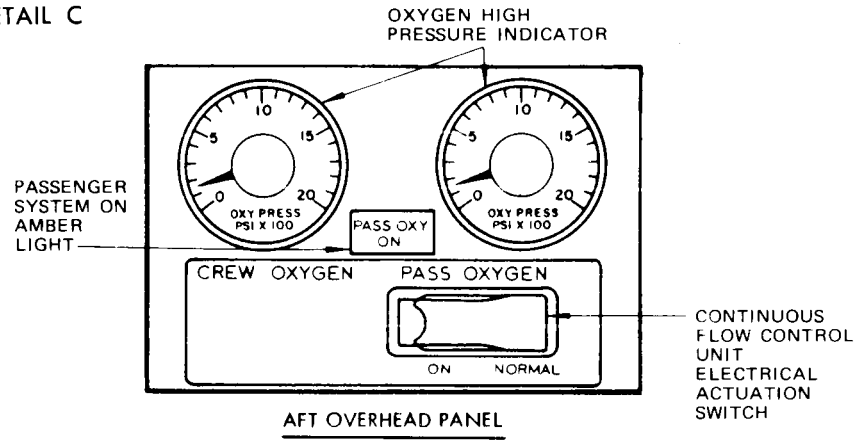
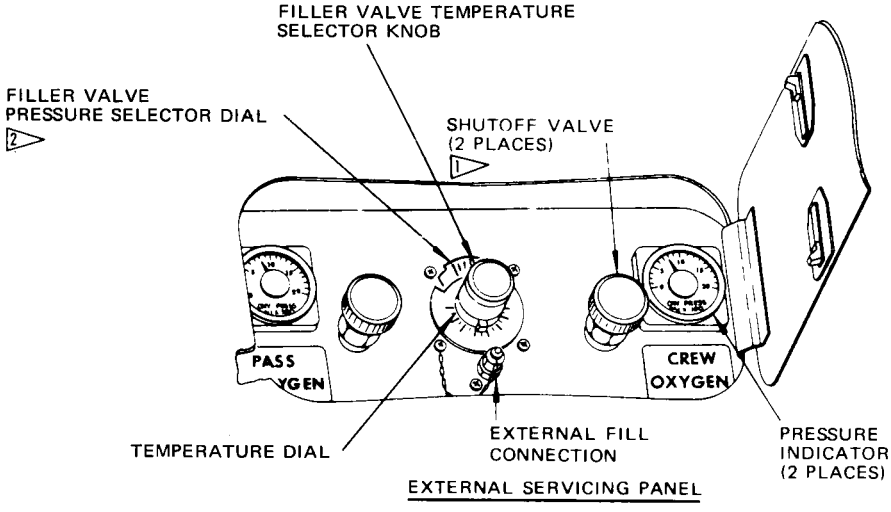


DETAIL C



AFT OVERHEAD PANEL

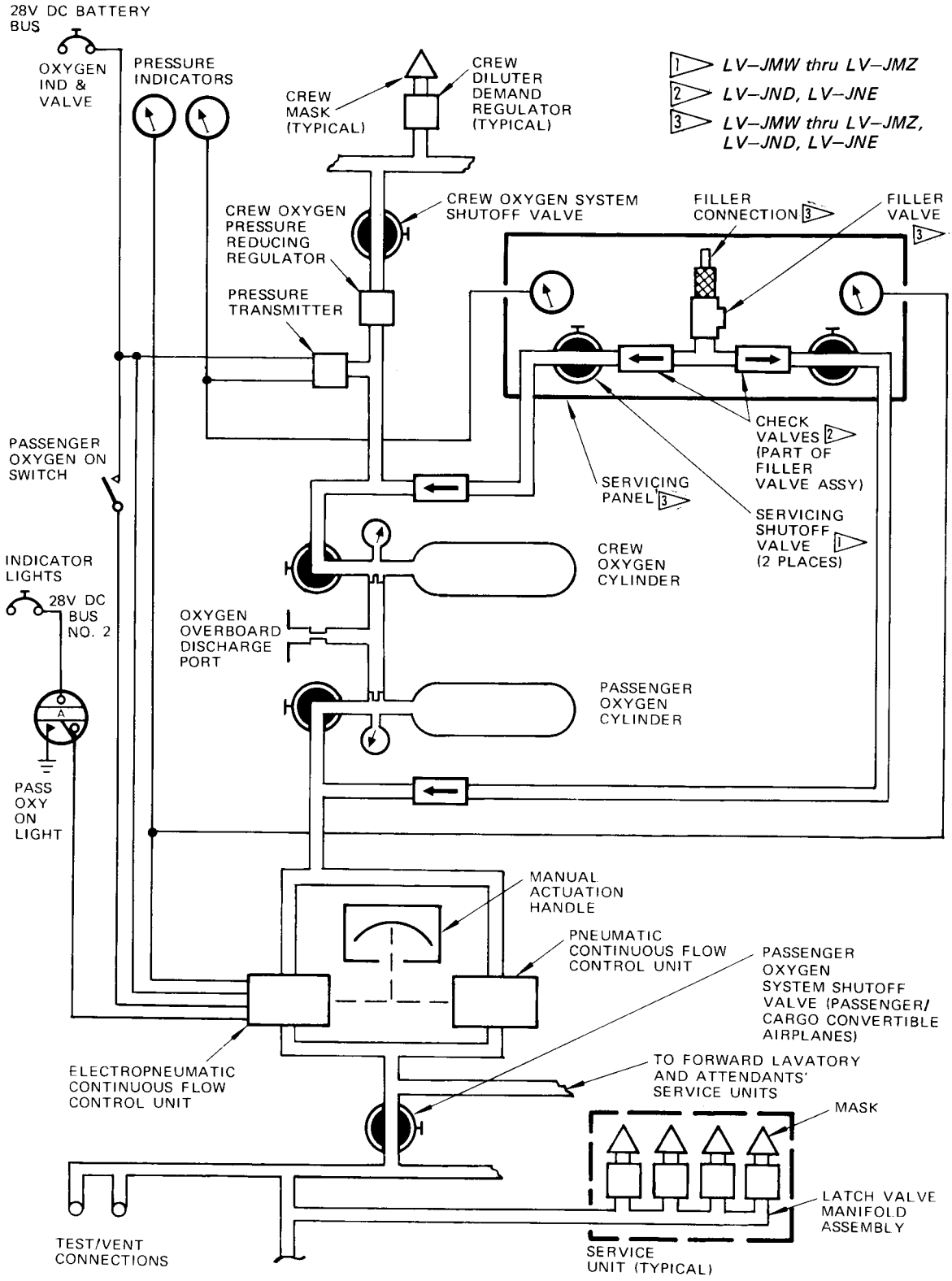
DETAIL B



EXTERNAL SERVICING PANEL

VIEW 1 3

Oxygen System Component Location
Figure 1 (Sheet 4)



Crew and Passenger Oxygen Systems Simplified Schematic
Figure 2

OXYGEN SYSTEMS - MAINTENANCE PRACTICES

1. General
   A. Oxygen system maintenance requires special emphasis on cleanliness and quality craftsmanship. Oxygen system maintenance personnel should be thoroughly knowledgeable with the instructions and general maintenance information presented in this section.
   B. When any maintenance is being performed on the airplane, special care should be exercised to prevent contamination of the oxygen system components (equipment, tubing, or fittings).
   C. Supplemental information concerning this subject is contained in the following Boeing Process Specifications: BAC5001 Fluid Lines, Fitting and Pressure Testing, BAC5402 Oxygen Systems.
2. Equipment and Materials
   A. Thread Compound - Krytox 240AC
   B. Oxygen System Leak Detection Compound (AMM Chapter 20, Miscellaneous Materials for approved materials)
3. Safety Precautions
4. Safety Precautions
   A. The following warning and safety precautions should be fully reviewed and carefully considered since failure to observe these instructions could result in serious injury to personnel and severe damage to the airplane and equipment. The oxygen system is for emergency use for breathing purposes and must therefore be hygienically clean to serve its purpose.
      (1) Do not permit oil, grease, flammable solvents, dust, lint, fine metal filings, or other combustible materials to come into contact with components or parts that will be exposed to pressurized oxygen.

WARNING: DO NOT ALLOW OIL, GREASE, OR OTHER FLAMABLE MATERIALS TO TOUCH OXYGEN SYSTEM COMPONENTS. THESE MATERIALS, WHEN EXPOSED TO PRESSURIZED OXYGEN, CAN IGNITE AND CAUSE AN EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

(2) As soon as practical after disconnecting oxygen plumbing, install clean, protective closures to open lines, fittings, or ports to prevent contamination of the system. Use only clean oxygen components. Clean, new plastic caps may be used on B-nuts and other fittings as long as they do not engage the thread. To prevent entry of plastic shreds, metal caps must be used where connector threads engage the cap.

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

(3) Keep oxygen away from all sources of ignition (hot exhaust, sparks, flame, smoking, etc.).

(4) Open all oxygen valves slowly to prevent sudden pressure rise. This will minimize the possibility of fire due to resultant temperature rise. Make sure that valves are also opened fully.

WARNING: OPEN OXYGEN SYSTEM VALVES SLOWLY. IF YOU OPEN A VALVE QUICKLY, THE TEMPERATURE OF THE OXYGEN CAN INCREASE. THIS CAN CAUSE A FIRE OR AN EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) When opening oxygen cylinder shutoff valves, observe also the following precautions:
1) Supply electrical power (AMM 24-22-0/201).
2) Close the OXYGEN IND & VALVE circuit breaker on P18 panel.
3) Slowly open oxygen cylinder valve to full open. Do not exceed 25 pound-inches (finger-tight). Then close valve one-fourth turn. Lockwire valve in this position when restoring the system to normal.

CAUTION: IF GIVEN TORQUE IS EXCEEDED, VALVE MAY BE DAMAGED.

4) Immediately make sure that applicable pressure indicator on aft overhead panel agrees with average of applicable oxygen cylinder gages ± 100 psi.

(b) When closing oxygen cylinder shutoff valves, observe also the following precautions:
1) Close oxygen cylinder valve finger-tight. This is equivalent to a maximum torque of 25 pound-inches.

CAUTION: IF GIVEN TORQUE IS EXCEEDED, VALVE MAY BE DAMAGED.

(5) Oxygen systems maintenance personnel should make sure that hands, clothing, equipment, and tools are clean and free of petroleum products before performing maintenance or servicing the oxygen system. Tools, which contact external surfaces of the oxygen system, must be visually clean and free of dirt, oil, or grease. Test equipment, which contacts or connects with internal portions of the oxygen system, must be clean in accordance with Cleaning/Painting instructions.

WARNING: DO NOT GET OIL, GREASE, DIRT, OR OTHER FLAMABLE MATERIALS ON OXYGEN SYSTEM COMPONENTS. THESE MATERIALS CAN CAUSE AN EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

WARNING: USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(6) Oxygen system maintenance personnel will put on clean, white, lint-free cotton gloves before they touch oxygen system components or do other maintenance to the system.
(7) Do not allow oxygen to mix with flammable gases and/or vapors (fuel, paint, thinners, cleaning solvents, etc.).
(8) When performing a leak detection test, only approved oxygen system leak detection materials shall be used. Leak detection compound shall be wiped off with a clean cloth immediately after testing.
(9) When oxygen system maintenance is being performed in a confined area (inside the airplane), make sure that adequate ventilation is provided to prevent a high concentration of oxygen.

(10) Use only oxygen-clean components in the oxygen system. Before installing a component in the oxygen system, make sure that component has been cleaned in accordance with Cleaning/Painting instructions and that all protective caps have been removed and that fittings are clean and free of contaminants, thread chips, etc.

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

(11) Do not pull plumbing components into alignment with the B-nut. This could produce cracks, which could result in fire and explosion. Never tighten fittings with oxygen system pressurized.

5. General Maintenance Information

A. The following general information is peculiar in most cases to oxygen systems and should be reviewed by maintenance personnel.

B. Leak Detection

(1) Unless the individual leaks are large enough to be heard or felt, leaks must be located using oxygen system leak detection compound. Apply the leak detection compound with a soft brush on all oxygen system connections suspected of leaking. Watch carefully for frothing, bubbling, or growing bubbles. Use mirror and light when necessary to view hidden connections. Test solution shall be wiped off with a clean cloth immediately after testing.

CAUTION: LEAK DETECTION COMPOUND SHALL NOT CONTAIN COMBUSTIBLE SUBSTANCES.

C. Oxygen System Hose Assemblies

(1) Two-inch spacing will be maintained between oxygen hose and electrical wiring when closing or installing PSUs and diluter demand regulators. If spacing is less than 2 inches, clamp hose and wiring as necessary to prevent chafing.

CAUTION: LACK OF REQUIRED SEPARATION MAY LEAD TO CHAFING BETWEEN OXYGEN HOSE AND ELECTRICAL WIRING.

D. Oxygen System Tubing Assemblies

(1) Cold drawn, 1/8 hard, corrosion-resistant steel tubing (CRES) per Specification MIL-T-6845 is used in the high pressure area of the oxygen system. The low pressure area uses MIL-T-6845 CRES tubing on the upstream portion, located mainly within the cargo compartment oxygen shroud. The downstream portion uses 6061-T6 seamless aluminum alloy tubing per Specification MIL-T-7081. The oxygen system uses flareless tube fittings in both the high and low pressure areas. When facilities are available, flareless tube assemblies may be fabricated per instructions in AMM Chapter 20, Flareless Tubing Assembly. Oxygen system tube assemblies should be cleaned per method specified in Cleaning/Painting and installed per instructions in this section and the individual component removal/installation procedures.

CAUTION: THERMAL COMPENSATOR ASSEMBLIES HAVE THE APPEARANCE OF TUBING ASSEMBLIES. TO PREVENT DAMAGE TO THERMAL COMPENSATOR ASSEMBLIES, REFER TO AMM 35-09-100 FOR THEIR LOCATION AND HANDLING.

E. Pipe Thread Sealing

(1) Pipe thread fittings may be sealed by the application of teflon tape Specification MIL-T-27730. Apply tape to the male thread only, leaving a minimum of 1-1/2 to 2-1/2 threads uncovered at the end of the fitting. Apply 1-1/2 turns of tape, stretching it as it wraps around the threads so that it conforms to thread contour. Make sure that there is no extrusion of thread past the end of the female fitting.

F. PSU Hose to Welded Manifold Connection

(1) Welded manifold PSU connections are installed on early airplanes. These welds are subject to cracks if the connection is torqued to standard values. Prior to connecting PSU hose to welded on adapter, apply thread compound, Krytox 240AC, very sparingly and carefully only to the first three complete threads from the end of the male fitting. Make sure that thread compound does not enter tubing or fitting where it can contaminate the system for breathing purposes. Never lubricate female threads. Prevent contamination of thread compound with any combustible material such as oil, grease, or lint.

G. Tightening Instructions

(1) All bolts, screws, and nuts used to install components in the oxygen system should be tightened to torque values specified in AMM Chapter 20. All tubing B-nuts, MS fittings, and hose fittings will be tightened to appropriate torque value listed in Fig. 201. When a special torque value different than those above is required for a specific installation, the torque value will be specified in the appropriate maintenance procedure.

CAUTION: NEVER TIGHTEN FITTINGS WITH OXYGEN SYSTEM PRESSURIZED.

H. Electrical Connectors

(1) Observe the caution below when working with the crew and passenger oxygen pressure indicators on the aft overhead panel P5 and, if installed, the external oxygen servicing panel.

CAUTION: CROSS-CONNECTION OF ELECTRICAL CONNECTORS MAY OCCUR WHEN WORKING WITH THE CREW AND PASSENGER OXYGEN PRESSURE INDICATORS ON THE AFT OVERHEAD PANEL P5 AND, IF INSTALLED, THE EXTERNAL OXYGEN SERVICING PANEL. CLEARLY IDENTIFY ELECTRICAL CONNECTORS BEFORE DISCONNECTING AND PERFORM OPERATIONAL CHECKOUT AFTER RECONNECTING.

TORQUE VALUES FOR MS FLARELESS TUBE AND HOSE FITTINGS *[1]

TUBING		TORQUE VALUES (INCH-POUNDS) ± 5% *[2]		
		HIGH PRESSURE TUBING	LOW PRESSURE TUBING	
SIZE	OD (INCH)	CORROSION-RESISTANT STEEL (SPEC MIL-T-6845)	CORROSION-RESISTANT STEEL (SPEC MIL-T-6845)	ALUMINUM (SPEC MIL-T-7081)
-5	5/16	190	190	140 *[2]
-6	3/8	270	--	170
-8	1/2	500	--	280
-10	5/8	700	--	360
-12	3/4	900	450	450
-16	1	1200	--	750

*[1] Flexible hose is used only in the low pressure system and will be tightened to the same torque values as aluminum tubing of the same size.

*[2] Maximum torque for PSU hose to welded manifold connection is 135 pound-inches.

6. Oxygen System Installation Practices
   A. The following general maintenance practices should be complied with when performing maintenance on the oxygen system.
   B. Preparation for Maintenance
      (1) Review safety precautions and determine extent of maintenance to be performed.
      (2) It is extremely important that exposure to any form of contamination be guarded against when performing maintenance on the oxygen system. Clean tools and clean white gloves should be used. Prior to performing the maintenance operation, plumbing connections should be wiped clean and dry if contamination is present. Contamination that cannot be removed with a dry cloth should be cleaned (Ref Oxygen System - Cleaning/Painting).

         WARNING: DO NOT ALLOW OIL, GREASE, DIRT OR OTHER FLAMABLE MATERIALS TO TOUCH OXYGEN SYSTEM COMPONENTS. THESE MATERIALS, WHEN EXPOSED TO PRESSURIZED OXYGEN, CAN IGNITE AND CAUSE AN EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

      (3) When maintenance is in a pressurized area of the system, the pressure should be bled off through the normal using outlet when possible. When it is not possible to do this, the plumbing connection should be loosened slightly to permit the pressure to bleed off. After the pressure has bled off, continue the disconnection.

         WARNING: REMOVE ALL PRESSURE FROM THE OXYGEN SYSTEM BEFORE YOU START THE REMOVAL OF A PART, TUBE, OR HOSE. A PRESSURIZED SYSTEM CAN CAUSE INJURY.

   C. Performing Maintenance
      (1) When disconnecting oxygen plumbing, use a backup wrench to prevent rotation of fitting to which B-nut attaches. Rotation of fitting could damage plumbing or component.

(2) As soon as practical after disconnecting oxygen plumbing, install clean, protective closures to open lines, fittings, or ports to prevent contamination of the system. Use oxygen clean fittings only. Clean new plastic caps may be used on B-nuts and other fittings as long as they do not engage the thread. To prevent entry of plastic shreds metal caps must be used where connector threads engage the cap.

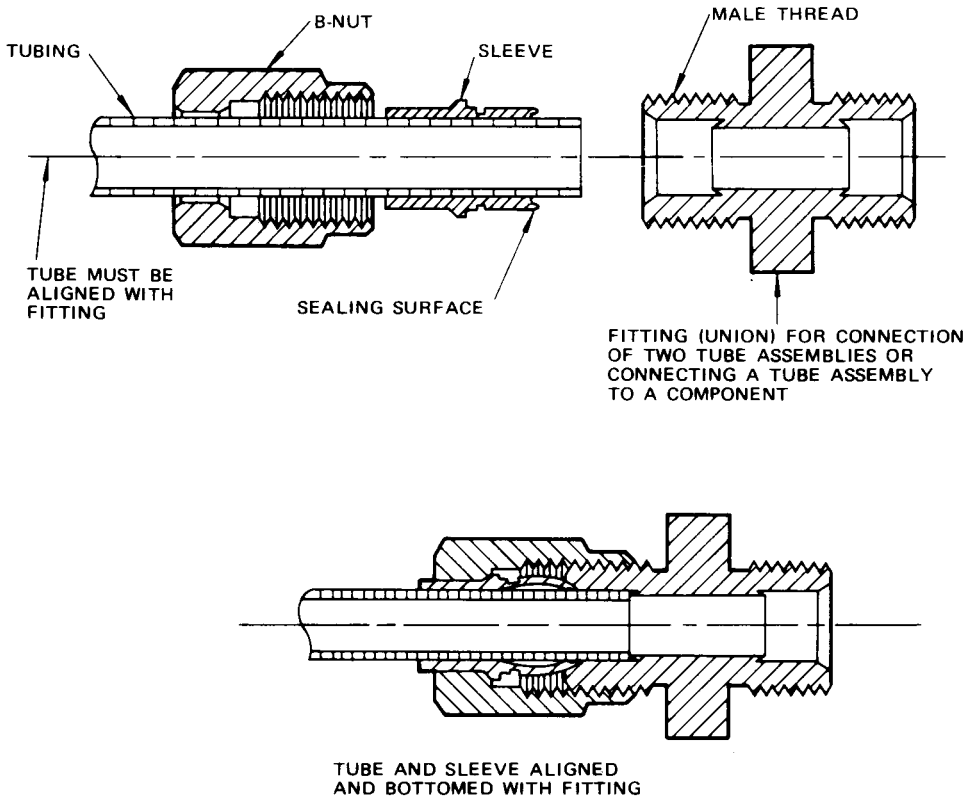
NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

(a) Plastic protective plugs and caps should not be reused.
(b) Protective metal caps may be reused after cleaning in accordance with cleaning/painting procedure.
(c) Plugs, which can be jammed into tubes, should not be used.
(d) Protective caps and plugs should be sealed in polyethylene bags and should not be opened until ready for use. After opening, the bags should be resealed immediately to prevent contamination of unused caps and plugs.

(3) Install only clean components, tubing, and fittings. Refer to Cleaning/Painting for approved cleaning method.

(4) On installation, position tubing assembly and component, then install tubing clamps and component fasteners loosely. Tubing with properly installed sleeve must be fully bottomed and in alignment with fitting before installing B-nut (Fig. 201). Start B-nut with fingers and tighten until it bottoms against sleeve shoulder. On fitting that B-nut engages, use a backup wrench to prevent rotation of fitting and possible damage to plumbing or components. Tighten B-nut with torque indicating wrench to torque value specified in maintenance procedure.

(5) At completion of the tubing connection, a leak detection test should be performed. If the connection leaks, check that specified torque values were used in tightening. If the leak persists at specified torque value, the connection should be disassembled and inspected for the cause. Defective parts must be replaced.



Tube and Fitting Installation
Figure 201

OXYGEN SYSTEMS - SERVICING

1. General
   A. Servicing the oxygen systems may be accomplished by replacing depleted cylinders with fully serviced cylinders or, on airplanes so equipped, through the external servicing panel using externally located ground servicing equipment. Servicing personnel should be familiar with 35-00, Maintenance Practices information. Refer to 12-15-21 for servicing requirements.

OXYGEN SYSTEM - CLEANING/PAINTING

1. General
   A. Cleanliness is most important in the installation and maintenance of the oxygen system. Strict cleanliness within oxygen system is important in two respects: in one, the system is used during an emergency for breathing, and secondly, oxygen supports combustion when a combustible contaminant and ignition conditions are present. Therefore, contamination within the system could provide noxious or toxic fumes to the user, prevent system components from operating properly, or produce fire and explosion. Contamination on the exterior surfaces of the oxygen system components can cause fires in the presence of leaking oxygen and ignition conditions.

      NOTE: All oxygen system components shall be clean and dry when installed.

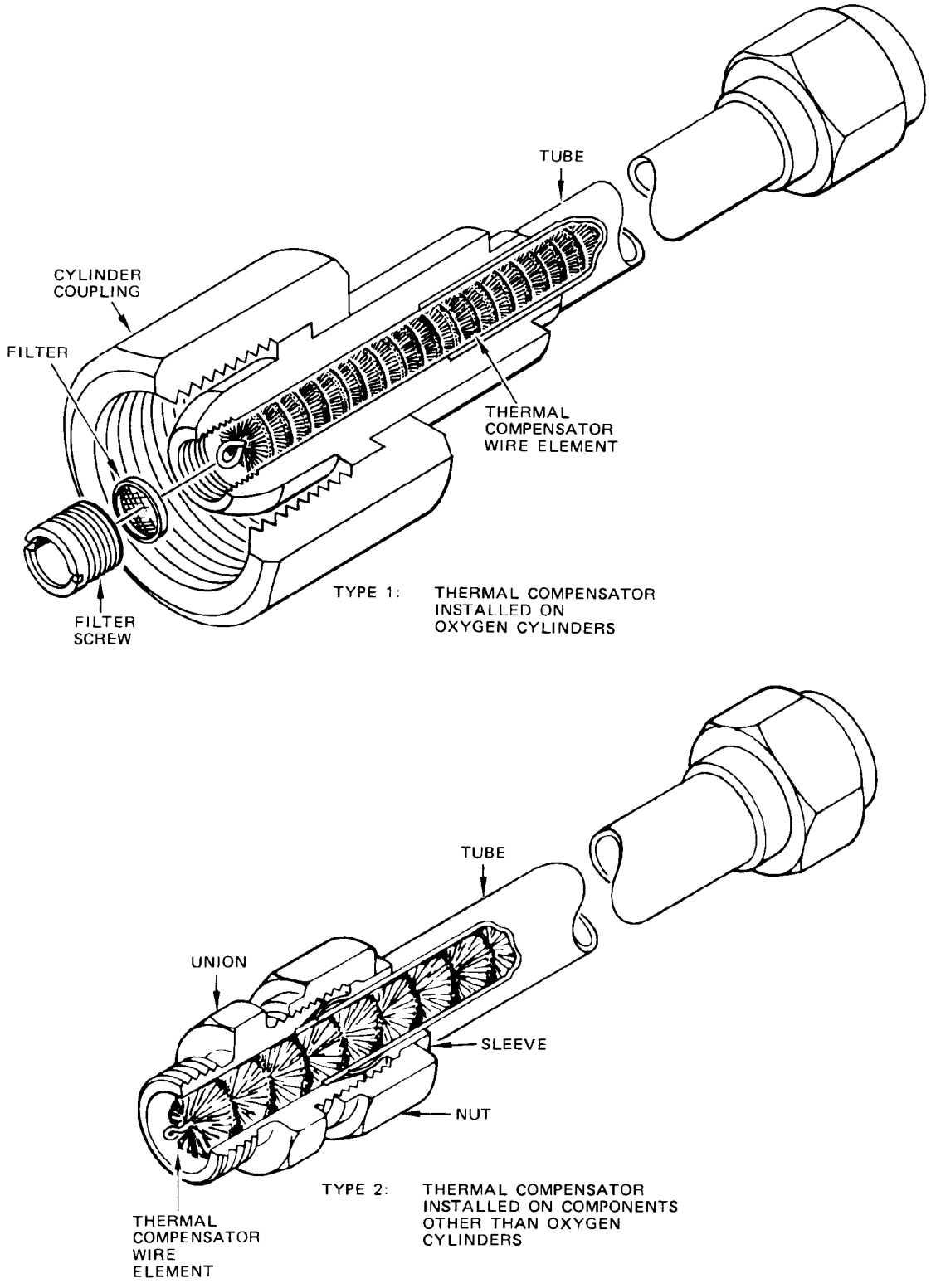
2. Cleaning Oxygen System Components
   A. Oxygen system components and plumbing installed on the airplane should be cleaned by wiping with a clean, dry, lint-free, white cotton cloth. Contamination that cannot be removed with a dry cloth should be cleaned with solvent, Series 96 (Ref AMM/SOPM 20-30-96). The cleaned area should then be wiped dry.

      WARNING: DO NOT USE CLEANING SOLVENTS OTHER THAN SERIES 96 (REF AMM/SOPM 20-30-96). FIRE MAY RESULT.

   B. Components on the airplane that cannot be cleaned by the above instructions must be removed from the airplane and cleaned as follows. Components such as valves, regulators, and cylinder assemblies must be disassembled and cleaned per the component manufacturer's overhaul manual. Thermal compensators are cleaned per 35-09-100. Tubing and fittings should be cleaned by the vapor degreasing system for oxygen components. Refer to Boeing 737 Overhaul Manual section 20-30-03.
   C. After cleaning, purge and dry with nitrogen or air. Use nitrogen per MIL-P-27401; or air with no particles or fibers greater than 100 microns in the longest dimension per cubic foot of air, no more than 3 PPM total carbon by weight or 7 PPM total CH4 by volume, and with moisture content not exceeding 0.00002 grams per liter of air at 70°F and 760 MM mercury (equivalent to a dew point of -63.6°F at 760 MM mercury).
   D. If components are not to be installed in airplane immediately, they should be stored. Refer to Boeing 737 Overhaul Manual section 20-70-01 for storage instructions.

THERMAL COMPENSATOR ASSEMBLIES - DESCRIPTION AND OPERATION

1. General
   A. Thermal compensator assemblies are installed at various places in the system (Fig. 1). Each compensator acts as a heat sink to prevent excessive temperature buildup when the tubing is being pressurized.
   B. A thermal compensator assembly consists of a brush-like wire element, approximately 5 inches long, inserted into a stainless steel tube. Each assembly is attached directly to an oxygen system component. The wire element fits tightly into the tube and is located in the end of the compensator assembly that attaches to the component.
   C. There are two types of thermal compensator assemblies.
      (1) TYPE 1 = This compensator assembly, installed on oxygen cylinders, has a standard oxygen bottle fitting that attaches to the cylinder. The downstream end has a standard flareless tube connection. This compensator assembly can be handled as any flareless tube assembly. A removable filter is provided in the cylinder coupling.
      (2) TYPE 2 = This compensator assembly, installed on components other than oxygen cylinders, is attached to the component by means of a corrosion resistant steel union. The wire element extends through the union. Whenever the union is rotated with respect to the compensator the wire bristles may interfere with sealing surfaces and cause leaks. The tube with its union and B nut attached must be handled as a single unit. The upstream end of the compensator assembly has a standard flareless tube connection.



Thermal Compensator Assembly
Figure 1

THERMAL COMPENSATOR ASSEMBLY - REMOVAL/INSTALLATION

1. General
   A. During removal/installation and cleaning, the thermal compensator assembly is not disassembled.
2. Removal/Installation of Thermal Compensator Assembly Installed on Oxygen Cylinder
   (TYPE 1 Thermal Compensators)
   A. Equipment and Materials
      (1) Oxygen system leak detection compound (Ref 20-30-51).
   B. Remove Thermal Compensator Assembly (Fig. 401)
      (1) Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
      (2) Open oxygen equipment shroud door.
      (3) Close all oxygen cylinder shutoff valves.
      (4) Disconnect connector coupling next to oxygen cylinder.
      (5) Disconnect B-nut at tube end of compensator assembly.
      (6) Remove compensator assembly.
      (7) As soon as practical after disconnecting oxygen plumbing, install clean, protective closures to open lines, fittings, or ports to prevent contamination of the system. Use only clean oxygen components. Clean, new plastic caps may be used on B-nuts and other fittings as long as they do not engage the thread. To prevent entry of plastic shreds, metal caps must be used where connector threads engage the cap.

      NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

   C. Install Thermal Compensator Assembly (Fig. 401)
      (1) Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00-00, Maintenance Practice.
      (2) Replace thermal compensator (optional: replace or clean compensator filter, Ref 35-09-100 C/P).
      (3) Position assembly.
      (4) Loosely connect connector coupling and B-nut.
      (5) Tighten connectors.

(6) Slowly open all oxygen cylinder shutoff valves.

WARNING: OPEN OXYGEN SYSTEM VALVES SLOWLY. IF YOU OPEN A VALVE QUICKLY, THE TEMPERATURE OF THE OXYGEN CAN INCREASE. THIS CAN CAUSE A FIRE OR AN EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Check for leaks using leak detection compound.
(8) Close oxygen equipment shroud door.

3. Removal/Installation of Thermal Compensator Assembly Installed on Components Other than Oxygen Cylinders (TYPE 2 Thermal Compensators)

A. General

(1) A thermal compensator assembly consists of the tube, thermal compensator and the union into which some of the compensator bristles extend.

CAUTION: ROTATION OF THE COMPENSATOR WITHIN THE UNION MUST BE HELD TO THE ABSOLUTE MINIMUM AS ROTATION MAY DAMAGE THE WIRE BRISTLES, THUS REDUCING EFFICIENCY, AND MAY CAUSE LEAKS. REPLACE THE COMPENSATOR ASSEMBLY IF THE COMPENSATOR AND UNION HAVE HAD ANY LONGITUDINAL MOTION OR IF THE COMPENSATOR AND UNION CAN BE READILY ROTATED BY HAND.

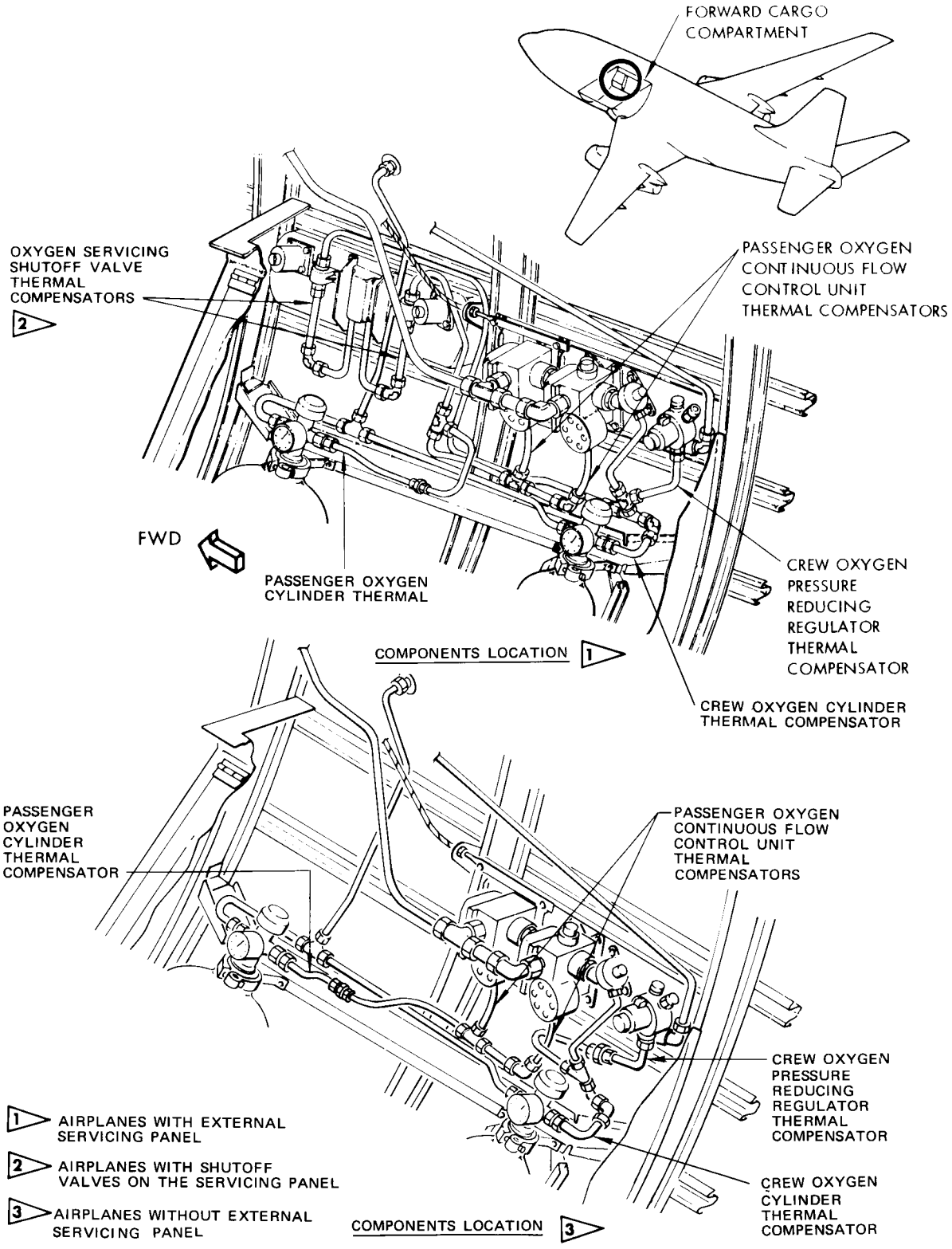
B. Remove Compensator Assembly (Fig. 401)

(1) Open oxygen equipment shroud door.
(2) Remove component and compensator assembly as a unit. Refer to specific component removal/installation instructions.
(3) Using wrench on union flats rather than B-nut, remove compensator assembly from component.

NOTE: Do not loosen compensator assembly B-nut when removing union from component.

C. Install Compensator Assembly (Fig. 401)

(1) Replace thermal compensator (Optional: clean existing compensator) (Ref Thermal Compensator Assembly - Cleaning/Painting).
(2) Install compensator assembly on component, using a wrench on union flats to tighten assembly.
(3) Install component and compensator assembly as a unit into the oxygen system. Refer to specific component removal/installation instructions.
(4) If it is necessary to rotate compensator assembly to align connections, loosen compensator assembly B-nut and rotate as required within one-half revolution, maximum, in relation to union. Refer to CAUTION above.
(5) Close oxygen equipment shroud door.



Thermal Compensators Installation
Figure 401

THERMAL COMPENSATOR ASSEMBLY - ADJUSTMENT/TEST

1. Thermal Compensator Assembly Test
   A. General
      (1) Thermal compensators are tested after cleaning to determine if there are restrictions that would prevent adequate gaseous flow through the units. Satisfactory compensators will permit a flow of 1000 liters per minute of air with a pressure drop of less than 200 psi for an inlet pressure of 2000 psi. The test unit is locally fabricated from the materials listed.
   B. Equipment and Materials
      (1) Portable test cylinder filled with air or nitrogen at 2000 ±100 psi, Use nitrogen per MIL-P-27401; or air with no particles or fibers greater than 100 microns in the longest dimension per cubic foot of air, no more than 3 PPM total carbon by weight or 7 PPM total CH4 by volume, and with moisture content not exceeding 0.00002 grams per liter of air at 70°F and 760 MM mercury (equivalent to a dew point of -63.6°F at 760 MM mercury).
      (2) Flowmeter - 0 to 1200 LPM
      (3) Pressure gage - 0 - 250 psi
      (4) Adequate tubing and fittings
   C. Test Thermal Compensator Assembly
      (1) Check that flow and pressure drop through compensator assembly meets the limits given in step 1.A.(1).

          NOTE: If pressure drop exceeds 200 psi, and compensator is being tested after cleaning, compensator must be replaced.

THERMAL COMPENSATOR ASSEMBLY - CLEANING/PAINTING

1. Equipment and Materials
   A. Portable test cylinder filled with air or nitrogen at 2000 ±100 psi. Use nitrogen per MIL-P-27041; or air with no particles or fibers greater than 100 microns in the longest dimension per cubic foot of air, no more than 3 PPM total carbon by weight or 7 PPM total CH4 by volume, and with moisture content not exceeding 0.00002 grams per liter of air at 70°F and 760 MM mercury (equivalent to a dew point of -63.6°F at 760 MM mercury).
2. Clean Thermal Compensator Assembly
   A. For thermal compensators installed on oxygen cylinders (TYPE 1 Thermal Compensators):
      (1) Remove filter from thermal compensator.
      (2) Clean filter and compensator by ultrasonic cleaning or by vapor degreasing process.
      (3) If filter is damaged, replace filter.
   B. For thermal compensators installed on components other than oxygen cylinders (TYPE 2 Thermal Compensators), clean by ultrasonic cleaning or by vapor degreasing process.

      CAUTION: IN NO CASE SHOULD THE THERMAL COMPENSATOR (WIRE BRUSH) BE SEPARATED FROM THE ASSEMBLY. REPLACE ASSEMBLY IF COMPENSATOR AND UNION HAVE HAD ANY LONGITUDINAL MOTION, OR IF COMPENSATOR AND UNION CAN BE READILY ROTATED BY HAND.

   C. After cleaning, purge and dry with nitrogen or air.
   D. For TYPE 1 thermal compensators, install filter on compensator.
   E. Test thermal compensator assembly (Ref 35-09-100, A/T).

OXYGEN SERVICING FILLER VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure applies to airplanes which have an external servicing filler valve with a temperature setting dial only. These airplanes have passenger and crew system external servicing shutoff valves on the servicing panel.
2. Equipment and Materials
   A. High pressure oxygen storage cylinders and ground servicing equipment (Refer to 12-15-21, Oxygen Servicing.)
   B. Oxygen System leek Detection Compound, Specification MIL-L-25567
3. Remove Filler Valve
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions. (Refer to 35-00, Maintenance Practices.)
   B. On airplane exterior, release latches and open oxygen external servicing panel access door.
   C. Check that crew and passenger oxygen servicing shutoff valves are closed.
   D. If necessary, remove dust cap.

      NOTE: If the larger size fill inlet filter is installed it will be necessary to remove dust cap and unscrew filter from inlet port before attempting to remove valve.

   E. Remove screws attaching filler valve to panel. (See figure 401.)
   F. In airplane interior, disconnect oxygen line connections from filler valve.
   G. Remove filler valve. Reinstall fill inlet filter on valve, if removed.

      NOTE: If necessary, remove dust cap chain from servicing panel and install dust cap on filler valve.

   H. Install protective caps at the filler valve ports and open lines. This is to prevent contamination of the oxygen system. Use only oxygen clean caps and plugs.

WARNING: USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

I. Remove and store gasket or discard, if damaged.

4. Install Filler Valve

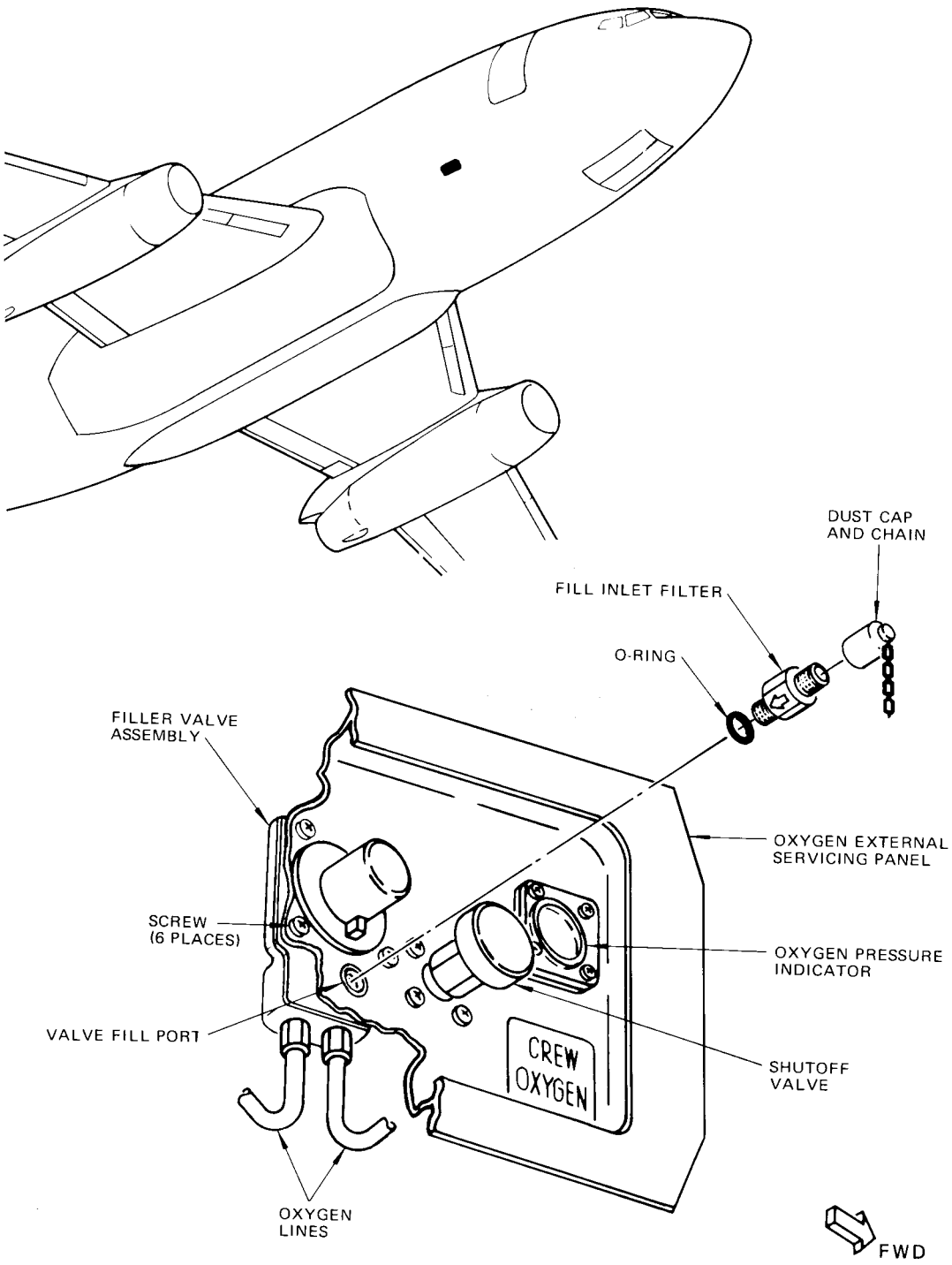
A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions (Ref 35-00, Maintenance Practices).
B. Remove protective caps from airplane lines and filler valve outlet ports.
C. Install gasket.
D. Position filler valve and connect lines loosely.

NOTE: If the larger size fill inlet filter is installed, do not attempt to install filler valve before removing filter.

E. On airplane exterior release latches and open external servicing panel access door.
F. Loosely install screws attaching valve to panel.
G. Tighten line connections and screws.
H. If valve was installed with larger size inlet filter removed, install filter, using new O-ring seal, with flow direction arrow on filter pointing inboard (Fig. 401).

CAUTION: THE LARGER SIZE FILL INLET FILTER REPLACES THE SMALL FLOW AREA INLET FILTER AND IS RECOMMENDED AS THE REPLACEMENT PART. SEE ILLUSTRATED PARTS CATALOG.

I. Service oxygen cylinders (Ref Chapter 12, Oxygen Servicing).
J. During and after servicing cycle, in airplane interior, check for leaks using oxygen system leak detection compound.
K. Close external fill shutoff valves. Remove servicing equipment.
L. Install dust cap and close and latch external servicing panel access door.



External Servicing Filler Valve Installation
Figure 401

466147

OXYGEN SERVICING FILLER VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure applies to airplanes which have an external servicing filler valve with both temperature and pressure setting dials. These airplanes do not have passenger and crew system external servicing shutoff valves on the servicing panel.
2. Equipment and Materials
   A. High pressure oxygen storage cylinders and ground servicing equipment (Ref 12-15-21).
   B. Oxygen system leak detection compound (Ref 20-30-51).
3. Remove Filler Valve (Fig. 401)
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions (Ref 35-00, Maintenance Practices).
   B. Open oxygen equipment shroud door. Ensure that valves on all oxygen cylinders are closed.
   C. On airplane exterior, release latches and open oxygen external servicing panel access door.
   D. Ensure that servicing panel is clean, then gradually unscrew pressure cap from filler valve filler port and allow any trapped gas to bleed off before final disengagement of threads.

      WARNING: FULL CYLINDER PRESSURE MAY EXIST INSIDE PRESSURE CAP. CAP MAY BE BLOWN OFF WITH SOME FORCE IF UNSCREWED TOO RAPIDLY TO ALLOW FOR VENTING OF TRAPPED GAS.

   E. Remove the six screws, with lockwashers, attaching filler valve to panel.
   F. In airplane interior, gradually loosen the oxygen line connections to the two filler valve outlet ports and allow any residual pressure to bleed off. Hold valve and complete the line removal.

      WARNING: RESIDUAL PRESSURE, IF NOT BLED, COULD BE AS HIGH AS 1850 PSI AND OXYGEN WOULD ESCAPE WITH EXTREME FORCE.

   G. Remove filler valve by guiding temperature and pressure dials through pear-shaped hole in panel. Remove gasket from inside surface of panel.
   H. Install pressure cap at filler valve filler port and cap open lines in airplane to prevent contamination of system.
4. Install Filler Valve
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions. (Refer to 35-00, Maintenance Practices.)
   B. On airplane exterior, release latches and open oxygen external servicing panel access door.

C. On airplane interior, ensure that gasket mating surface on inside of servicing panel is clean and free of pieces of old gasket, etc. Place new gasket in position on panel; use filler valve attaching screws, with lockwashers, to hold gasket in position.

NOTE: The two lower filler valve attaching screws are a smaller diameter.

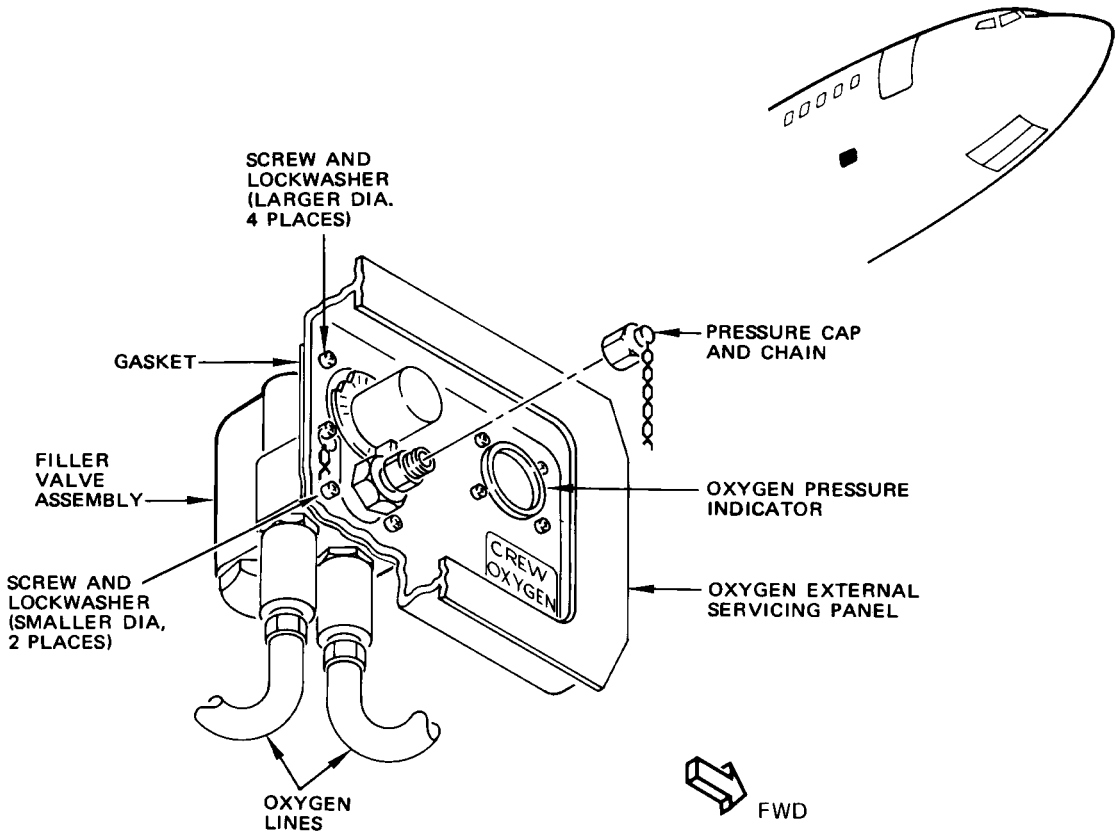
D. Remove protective caps from the two airplane oxygen lines and filler valve outlets. Connect lines loosely to valve outlet ports. (See figure 401.) Leave pressure cap on filler valve filler port.
E. Guide filler valve temperature and pressure dials and filler port filter through pear-shaped hole in panel and line up attaching screw holes in valve with installed screws in panel. Hold screws in place on airplane exterior to prevent loss.
F. Loosely engage the six valve attaching screws. Remove the aft center screw and reinstall loosely with the pressure cap chain or cable end installed on screw.

NOTE: Ensure that lockwasher is in place next to screw head.

G. Tighten line connections and screws.
H. Slowly open all oxygen cylinder shutoff valves.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

I. Remove pressure cap from filler valve filler port. Connect oxygen ground servicing equipment and service airplane oxygen systems (Ref 12-15-21, Oxygen Servicing).
J. Check for leaks at filler valve line connections using leak detection compound.
K. Close oxygen equipment shroud door.
L. Remove ground servicing equipment and install pressure cap on filler valve filler port.
M. Close and latch external servicing panel access door.



External Servicing Filler Installation
Figure 401

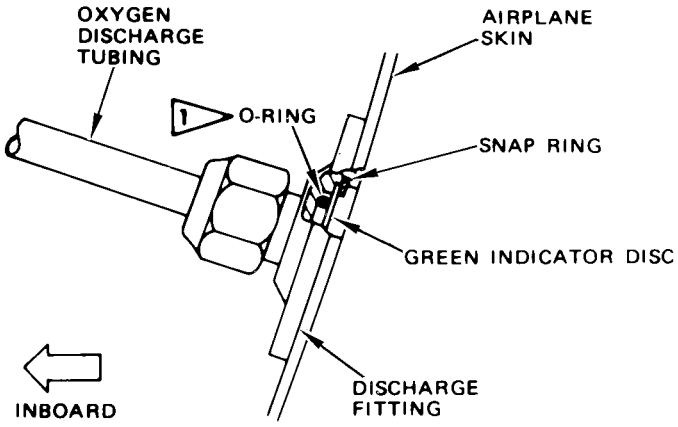
466151

DISCHARGE INDICATOR DISK - REMOVAL/INSTALLATION

1. General
   A. The discharge indicator disk, at the overboard discharge port, blows out when pressure in the overboard discharge line reaches 500 psi. This normally happens only when the cylinder discharges through the safety relief valve. If disk has blown out, the following procedure must be followed for replacement.
2. Install Discharge Indicator Disk (Fig. 401)
   A. Equipment and Materials
      (1) O-ring - BACP11J15 (Limited, See Fig. 401 for effectivity)
      (2) Snap Ring - Walter Kidde P/N 17917
      (3) Indicator Disc - Walter Kidde P/N 203337
   B. Install Disk
      (1) On airplanes with an O-ring (See Fig. 401 for effectivity) install O-ring in recessed area between discharge fitting and disk.

          CAUTION: IF O-RING IS NOT INSTALLED, MOISTURE MAY ENTER LINE AND FREEZE, WHICH MAY CAUSE DAMAGE TO OXYGEN EQUIPMENT.

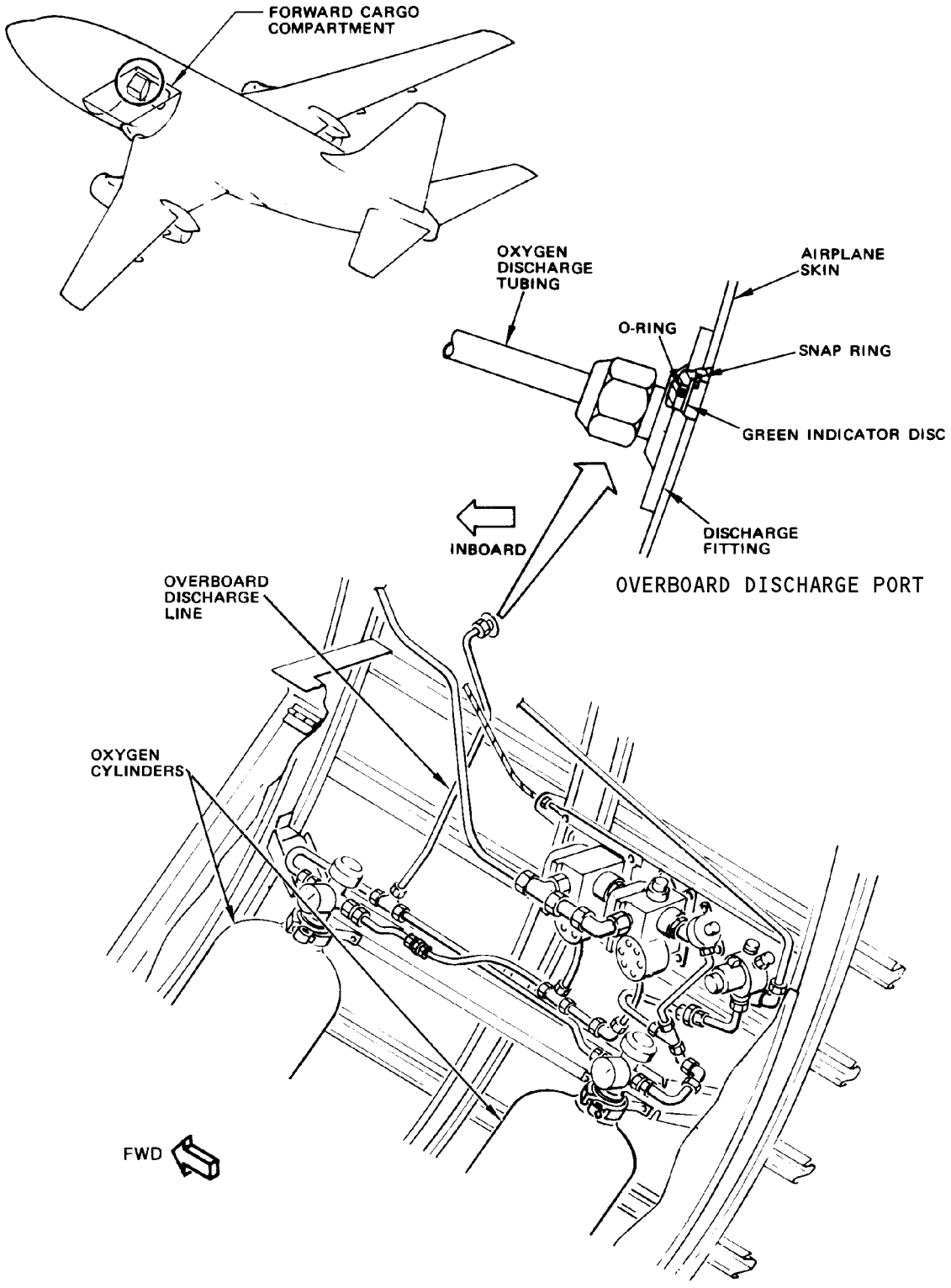
      (2) Install disk.
      (3) Install snap ring.



Discharge Indicator Disk Installation
Figure 401

OVERBOARD DISCHARGE LINES - MAINTENANCE PRACTICES (PURGING)

1. General
   A. This section outlines procedure to purge overboard discharge lines of moisture. Moisture, if collected in overboard discharge line, may gravitate to oxygen bottle relief valves. Enough moisture during a sufficiently hard freeze could cause valves to rupture and deplete passenger or crew oxygen system.
2. Purge Line (Fig. 201)
   A. Gain access to oxygen cylinders.
   B. Disconnect discharge lines at all oxygen bottles.
   C. Remove snap ring, green indicator disc and O-ring seal from overboard discharge indicator.
   D. Connect hose from oil free regulated nitrogen supply (MIL-P-27401) to one discharge tube. Regulate nitrogen to 25 psi and purge discharge system for 10 minutes or until all moisture is removed.
   E. Disconnect hose from discharge tube and reconnect all discharge tubes to oxygen bottles.
   F. Replace O-ring seals and reinstall green indicator disc with snap ring.

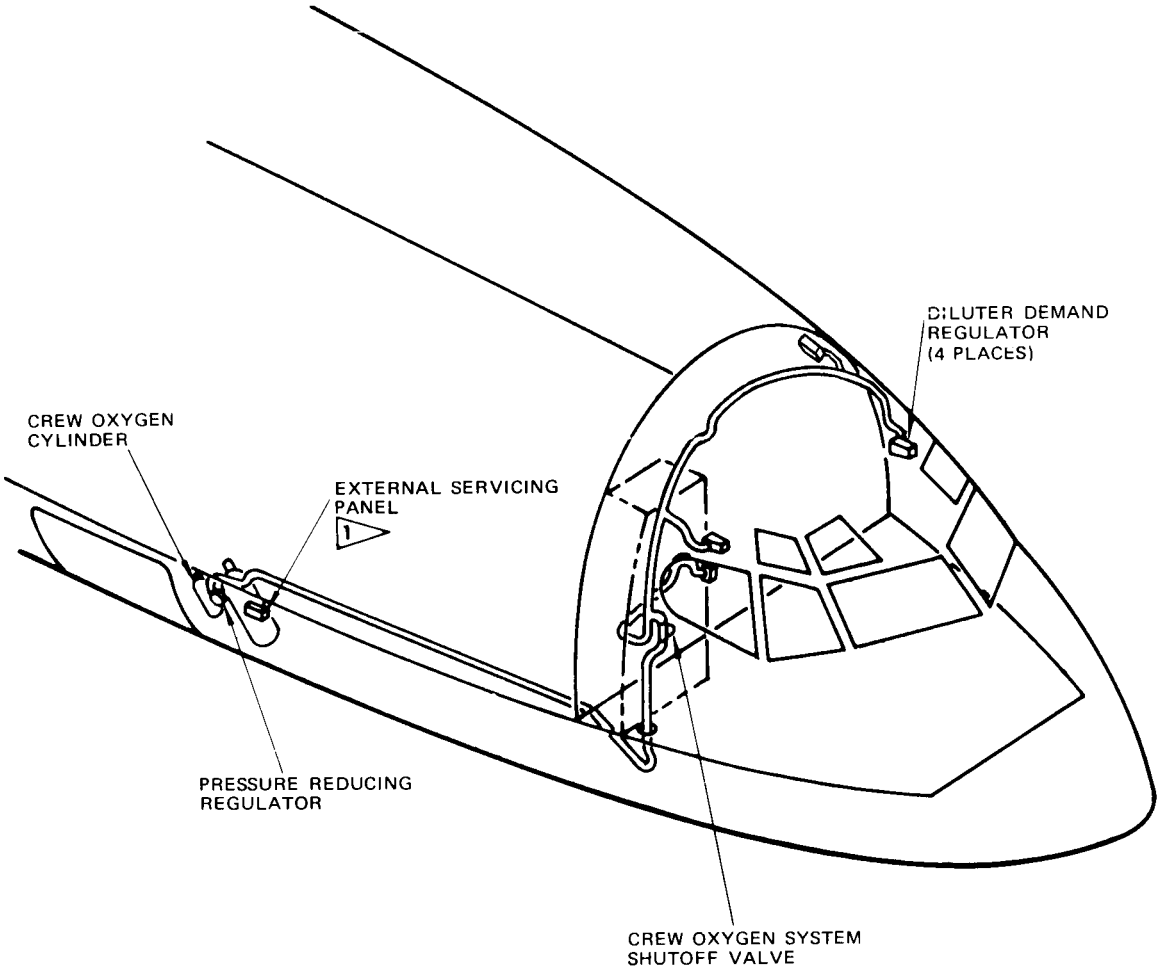


Overhead Discharge Line
Figure 201

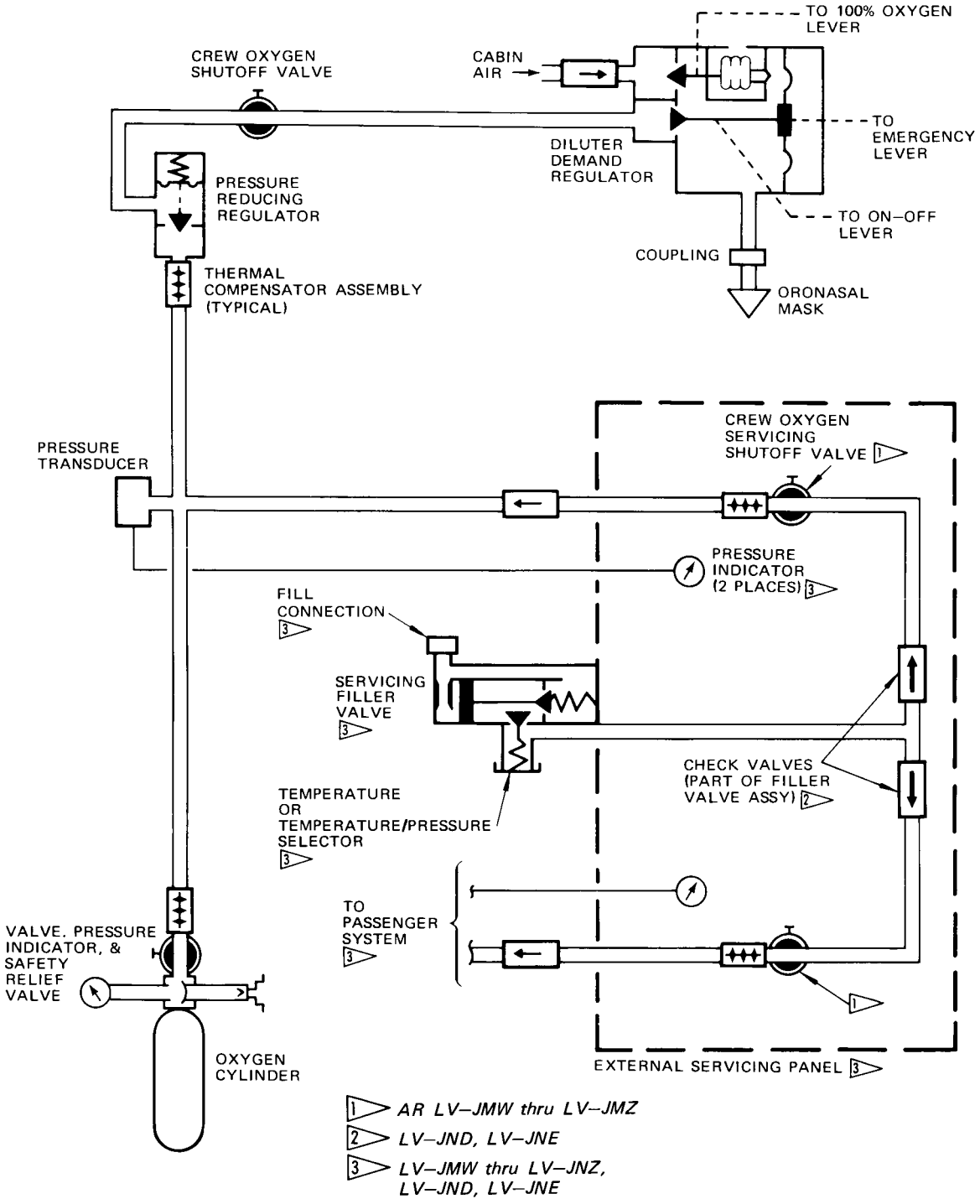
466163

FLIGHT CREW OXYGEN SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The flight crew oxygen system delivers supplemental and protective breathing oxygen. The system consists of a high pressure oxygen cylinder assembly, pressure reducing regulator, shutoff valve, oxygen distribution lines, and diluter demand regulators. At each crew station, a diluter demand regulator is connected to an oronasal mask (Fig. 1 and 2).
   B. The oxygen cylinder assembly includes a safety relief valve to provide protection against excessive pressure and (on airplanes so equipped) a provision for refilling through an external servicing panel. High pressure oxygen is expanded to low pressure oxygen by the pressure reducing regulator. The flow of low pressure oxygen to each individual mask is controlled by a diluter demand regulator.
2. Crew Oxygen Cylinder
   A. The crew oxygen cylinder assembly includes a slow-opening shutoff valve, pressure gage, and safety relief valve to discharge cylinder contents overboard when cylinder pressure exceeds a safe limit. The safety relief valve is manifolded to a line connected to an overboard discharge port in the airplane skin. The overboard discharge line serves both the crew and passenger systems.
   B. The oxygen cylinder has a capacity of 76 cubic feet on airplanes with shutoff valves on the servicing panel, and 39 cubic feet on all other airplanes. This capacity is expressed in terms of standard oxygen compressed t o 1850 psi at 70°F.
   C. The cylinder assembly is mounted in the forward cargo compartment in a shroud forward of the cargo door (Fig. 1).
3. Crew Oxygen Shutoff Valve
   A. The crew system shutoff valve is a manually operated valve that shuts off oxygen pressure to the flight crew oxygen system. The valve is located in the control cabin, behind the first officer, directly accessible on panel P6.
4. Crew Oxygen Pressure Reducing Regulator
   A. The pressure reducing regulator is mounted above the crew and passenger oxygen cylinders. It consists of inlet and outlet ports, a valve, an actuator shaft, an actuator linkage, a diaphragm and a spring. (Fig. 3)
   B. Operating pressures of the regulator are as follows:
      (1) Flow will take place with an inlet pressure of 150 to 1800 psig.
      (2) Outlet pressure is a variable depending on inlet pressure and flow rate (in liters per minute). Outlet pressure will always be in the range of 50 to 75 psig.
      (3) "Regulated pressure" is outlet pressure at zero flow and a specified inlet pressure. Regulated pressure for this regulator is set at 70 to 75 psig when inlet pressure is 150 psig.



Flight Crew Oxygen System Component Location
Figure 1



Flight Crew Oxygen System Schematic
Figure 2

C. The normal operating cycle is as follows: oxygen flows through the outlet port to the diluter demand regulator lowering the pressure inside the pressure-reducing regulator. This allows the spring to overcome the diaphragm force and push the actuator linkage down, which causes the actuator shaft to open the inlet valve admitting more oxygen into the pressure reducing regulator to continue the cycle as necessary to maintain the outlet pressure within the specified range.

D. The relief valve is set to open at pressures in excess of 100 to 110 psig, and reset at 90 to 100 psig.

5. Crew Oxygen Distribution Line and Overboard Discharge Line

A. The oxygen distribution line has a high-pressure section and a low-pressure section. The high-pressure section, between the oxygen cylinder assembly and the pressure-reducing regulator, is made of stainless steel tubing. The low-pressure section, downstream of the regulator forward to Station 251.6, is made of stainless steel tubing with the remaining portion aluminum alloy tubing. Flareless tube fittings are used throughout the system.

B. The overboard discharge line connects the oxygen cylinder safety relief valve to the oxygen overboard discharge port in the airplane skin. This line is made of stainless steel tubing. The overboard discharge port incorporates an indicator (a plastic disk) which prevents entry of dirt, grease, etc., into the discharge line. The indicator blows out at 500 psi to allow oxygen to discharge overboard.

C. B-nuts with a baked-on, dry film lubricant are used for line and component connections throughout the system.

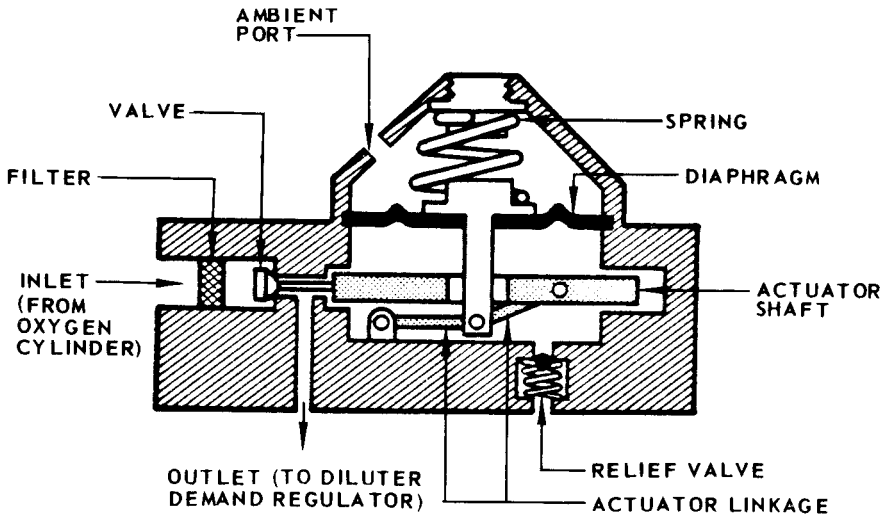
6. Diluter Demand Regulator

A. A diluter demand regulator is mounted at each flight crew station (Fig. 4). Each regulator face displays a float-type flow indicator, which signals oxygen flow through the regulator to the mask.

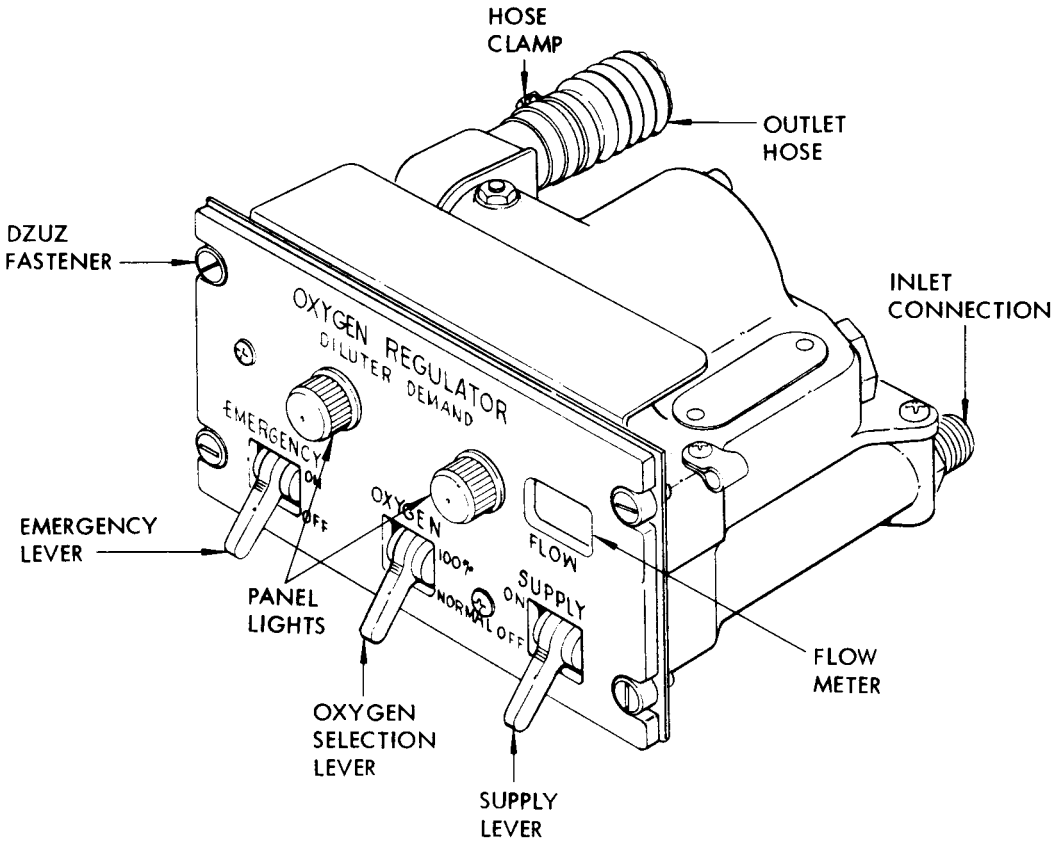
B. The regulator face also displays three manual control levers. A supply lever (SUPPLY ON-OFF) is used to open or close the oxygen supply valve. An emergency lever (EMERGENCY ON-OFF) is used to obtain oxygen under pressure. An oxygen selection lever (OXYGEN 100% NORMAL) is used for selecting the air/oxygen mixture or oxygen only.

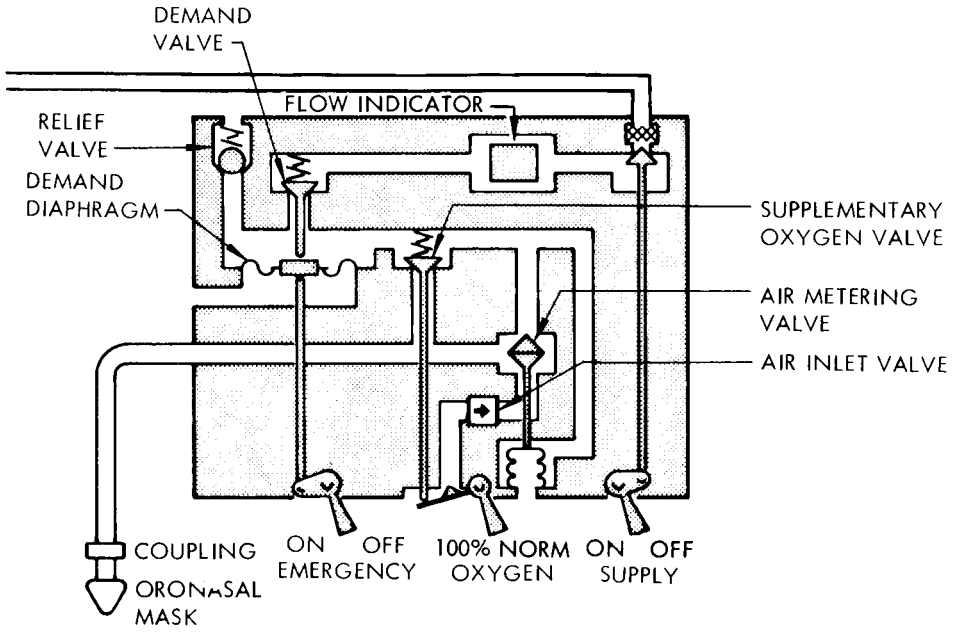
C. Operation of the regulator is as follows:

(1) With the supply lever in the ON position, the oxygen selection lever in the NORMAL position, and the emergency lever in the OFF position, oxygen enters the regulator inlet. When there is sufficient differential pressure across the demand diaphragm, the demand valve opens to supply oxygen to the mask (Fig. 4). This pressure differential exists during the user's inhalation cycle. After passing through the demand valve the oxygen is mixed with air that enters through the air inlet port. The mixture ratio is determined by an aneroid controlled metering valve, which provides a high oxygen ratio at high cabin altitudes, and a high air ratio at lower cabin altitudes. An air inlet valve is set to permit the airflow to begin at the same time as the oxygen flow.



Pressure Reducing Regulator Schematic
Figure 3





Diluter Demand Regulator
Figure 4

(2) The addition of air may be cut off by turning the oxygen selection lever to OXYGEN 100%. When this lever is in OXYGEN NORMAL air enters through the air inlet port and the required amount is added to the oxygen to form the correct air/oxygen mixture.

(3) Positive pressure at the regulator outlet may be obtained by operating the emergency lever to ON. This mechanically loads the demand diaphragm to provide positive outlet pressure of 2 to 4 inches of water.

7. Crew Oxygen Mask

A. Oronasal masks are provided for each flight crewmember. The oronasal mask covers the mouth and nose. All masks are equipped with a microphone. Each of the oronasal masks is connected to the diluter demand regulator by a flexible hose through a quick-disconnect coupling.

8. External Servicing Panel (Airplanes so equipped)

A. External servicing of the crew oxygen cylinder is accomplished through a servicing panel installed under a latched door on the right side of the lower fuselage section (Fig. 1). The servicing panel is common to both the crew and passenger oxygen systems. It incorporates a filler valve, filler connection, two servicing shutoff valves (on servicing panels so equipped), and two pressure indicators. These components are accessible slightly forward of the passenger oxygen cylinder assembly.

B. The filler valve is common to both systems. It automatically controls the rate of filling by means of a pressure-time delay mechanism, to prevent excessive temperature rise in the oxygen system during filling. The valve shuts off automatically when the cylinder pressure reaches the equivalent of 1850 psi at 70°F. On airplanes with servicing shutoff valves, an adjustment knob and a graduated scale (-20 to +120°F) permit adjustment for different oxygen cylinder area ambient temperatures. On airplanes without servicing shutoff valves a pressure adjustment dial is provided on the filler valve, in addition to the temperature adjustment, to allow for variation in final cylinder pressure as a function of initial cylinder pressure. The dual adjustment filler valve contains an integral check valve in each outlet port which eliminates the need for servicing shutoff valves.

(1) The pressure-time delay mechanism consists of a valve attached to a diaphragm. The diaphragm is acted upon by a spring on one side, and by pressure in a chamber on the other side. At the beginning of the filling operation there is no pressure in the chamber and the valve is fully closed. As high pressure oxygen is supplied to the filler valve, the chamber fills and the pressure counteracts the spring, causing the valve to open as required to produce the rate of servicing and final pressure corresponding to the temperature setting. The temperature correction knob and pressure setting dial act to vary the tension in the spring as needed for each temperature or pressure setting.

(2) Both crew and passenger cylinders are manifolded together by internal flow passages in the filler valve which permit simultaneous servicing of each system's cylinder(s). For airplanes with servicing shutoff valves, the crew and passenger cylinders can be serviced separately by opening only the shutoff valve for the system to be serviced. When both systems require servicing it is recommended that it be done at the same time whenever possible. Separate servicing requires a minimum of 30 minutes to elapse between the end of one servicing cycle and the beginning of the next to allow filler valve to cool. It is also necessary to temporarily break servicing connection on filler port to ensure release of pressure chamber pressure.

WARNING: DO NOT START SERVICING UNLESS 30 MINUTES HAVE PASSED SINCE THE END OF THE LAST SERVICING CYCLE TO AVOID THE POSSIBILITY OF OVERPRESSURE AND EXCESSIVE TEMPERATURE.

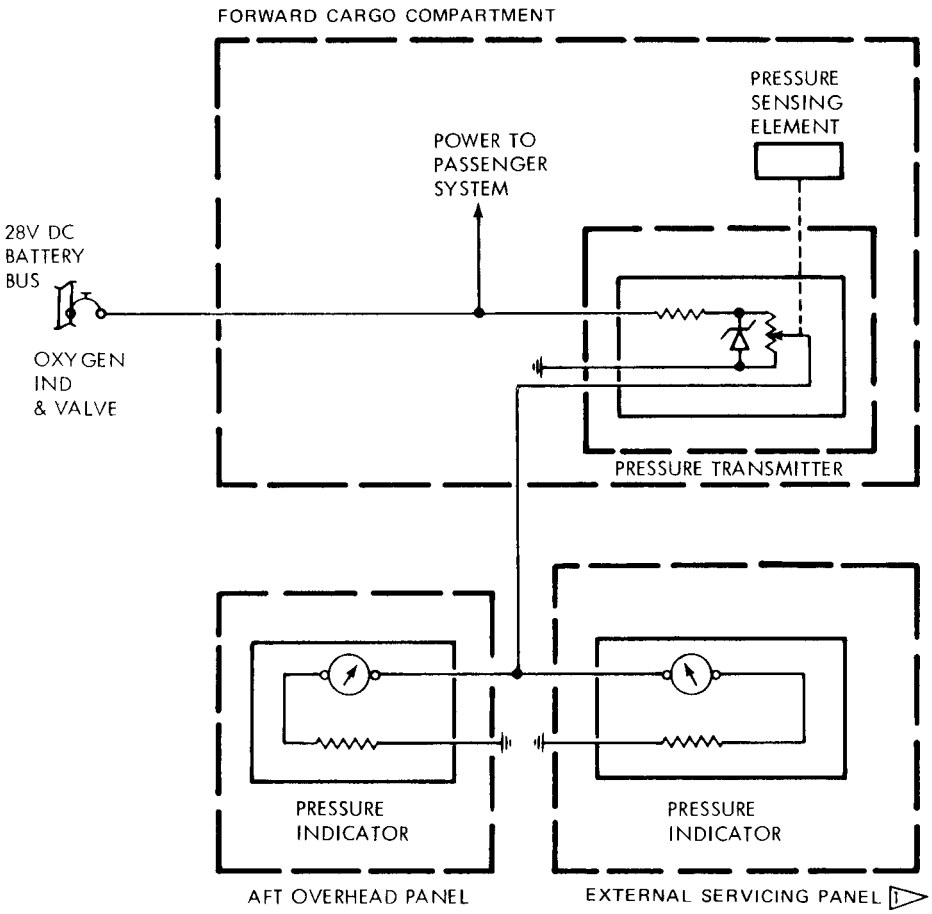
(3) Two types of filler port caps are used to protect and seal filler connector port when not in use. Both types are retained to the servicing panel by a short length of chain or cable. For airplanes with servicing shutoff valves, a dust cap is used on the filler port. The dust cap is used only to protect the connector port and prevent entrance of dirt. A bleed hole in the dust cap prevents residual pressure buildup in the valve pressure chamber. For airplanes without servicing shutoff valves a pressure type cap is used on the filler port. In addition to protecting the connector port and preventing entrance of dirt, the pressure cap provides a pressure seal backup to the filler valve main valve and integral check valves. The pressure cap is made so that a bleed hole is uncovered and vents any backpressure before the last two threads are disengaged during cap removal.

WARNING: FULL CYLINDER PRESSURE MAY EXIST INSIDE PRESSURE CAP. CAP MAY BE BLOWN OFF WITH SOME FORCE IF UNSCREWED TOO RAPIDLY TO ALLOW FOR VENTING TRAPPED GAS.

NOTE: Ensure that pressure cap is tight after each installation. A loose cap may allow back leakage to reduce oxygen cylinder pressure.

C. A pressure indicator senses pressure of the crew system cylinder. This pressure can be read on the external servicing panel.

9. Crew Oxygen Pressure Transducer and Indicators
   A. The pressure transducer is mounted on the crew oxygen line near the cylinder. It contains a bourdon tube with a wiper blade. Variation in pressure repositions the wiper blade on a resistor. A voltage regulator circuit supplies constant voltage to the potentiometer. The circuit is completed with two pressure indicators, one on the external servicing panel and one on the aft overhead panel. (See figure 5)
   B. Each indicator consists of a unit, which senses a voltage output signal from the pressure transducer and indicates the corresponding pressure on a dial calibrated from 0 to 2000 psi.
10. Thermal Compensator Assemblies
   A. Thermal compensator assemblies are installed at various places in the high-pressure system. (See figure 2) For a description of thermal compensators refer to 35-09-100.
11. Operation
   A. Oxygen is stored by the crew oxygen cylinder normally at a pressure of 1850 psi. The pressure-reducing regulator reduces this pressure and supplies oxygen to the diluter demand regulator at 50 to 75 psi. (See figure 2)
   B. Oxygen is available to each respective crewmember whenever the diluter demand regulator supply lever is in the ON position. For diluter demand regulator and mask operation, refer to Diluter Demand Regulator.



1 *LV–JMW thru LV–JMZ, LV–JND, LV–JNE*

Crew Oxygen Pressure Transmitter and Indicating Circuit
Figure 5

FLIGHT CREW OXYGEN SYSTEM - TROUBLE SHOOTING

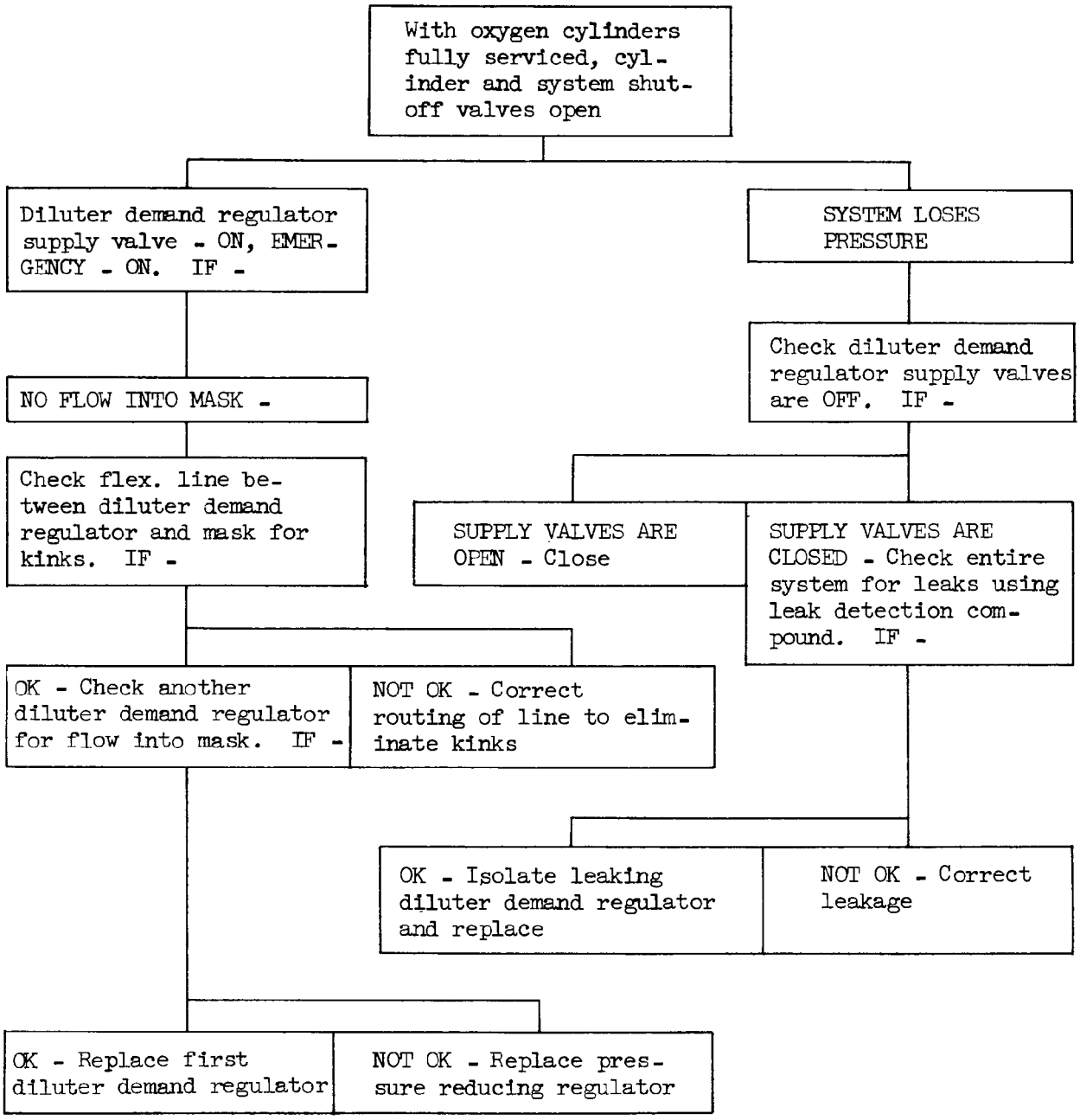
1. General
   A. The flight crew oxygen system is capable of holding pressure almost indefinitely under conditions of no use with the cylinder shutoff valve open and the supply valve of each diluter demand regulator OFF.

Apparent loss of pressure may be due to temperature change or leakage of the system. Oxygen cylinders are charged to 1850 psi at 70°F. Refer to the Temperature Correction Chart, Fig. 102, for variations.

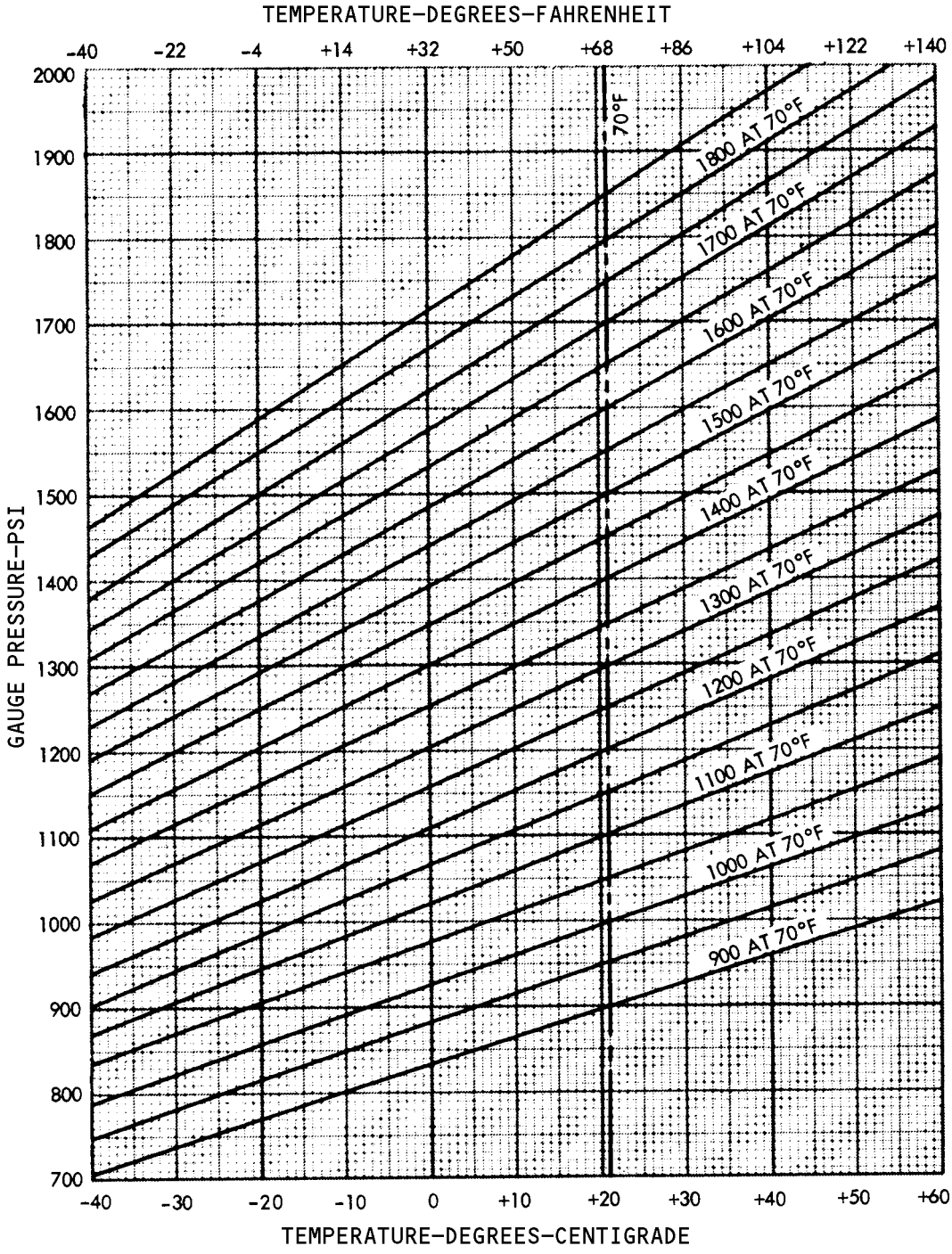
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.

2. Equipment and Materials
   A. Oxygen System Leak Detection Compound. Refer to Chapter 20, Miscellaneous Materials

3. Trouble Chart



Flight Crew Oxygen System - Troubleshooting
Figure 101



Oxygen Cylinder Pressure Temperature Correction Chart
Figure 102

FLIGHT CREW OXYGEN SYSTEM – ADJUSTMENT/TEST

1. Flight Crew Oxygen System Test
   A. General
      (1) The flight crew oxygen system test consists of checking for leakage and system operation. If nonoperating type equipment, such as tubing, manually operated valves, and oxygen cylinders were replaced, only the leakage test must be performed. If operating components, such as regulators, were replaced both leakage and operation tests must be performed.
         (a) The leakage test may be either a simplified test using leak detection compound or a time/pressure decay leak test. The simplified test is limited to a check of reconnected or replaced line fittings which are readily accessible for viewing, either directly or with the aid of mirrors.
         (b) The high pressure time/pressure decay leak test procedures are different depending on whether the airplane has an external servicing panel and, if it does, whether it has servicing shutoff valves. Each possibility is covered in a different paragraph.
      (2) Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
   B. Simplified System Leakage Test

      NOTE: Refer to par. 1.A.(1)(a) for use limitations.

      (1) Equipment and Materials
         (a) Crew oxygen cylinder, serviced to 1800 ±100 psi
         (b) Oxygen System Leak Detection Compound (Ref 20-30-51)
      (2) Perform Leak Test
         (a) Slowly open crew oxygen cylinder shutoff valve.

            WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

         (b) Close cylinder shutoff valve immediately if audible or other indication of high leakage rate is evident.

            WARNING: HIGH PRESSURE OXYGEN LEAKAGE MAY BE DANGEROUS TO PERSONNEL AND EQUIPMENT AND MUST BE AVOIDED.

         (c) Apply leak detection compound, per section 35-00, Maintenance Practices, to all portions of fitting. There shall be no detectable leakage.

C. Time/Pressure Decay Leakage Test
(1) Equipment and Materials
(a) External pressure source (use one of the following):
1) Portable test cylinder filled with air or nitrogen at 2000 +100 psi. Use nitrogen per Mil-P-27041; or air with no particles or fibers greater than 100 microns in the longest dimension per cubic foot of air, no more than 3 PPM total carbon by weight or 7 PPM total CH4 by volume, and with moisture content not exceeding 0.00002 grams per liter of air at 70°F and 760 MM mercury (equivalent to a dew point of -63.6°F at 760 MM mercury).
2) Portable Test Cylinder filled with oxygen at 2000 ±100 psi. (Oxygen per Specification MIL-O-27210, Type 1 is preferred. Deviation per S.A.E. (AS 1065) for moisture content is allowed.)
(b) Pressure Gage, 0 to 2000 psi with an accuracy of + 2%, graduations not more than 100 psi apart, and a dial diameter of not less than 4 inches.
(c) Pressure Gage, 0 to 150 psi
(d) Oxygen System Leak Detection Compound (Ref 20-30-51)
(2) Perform Leak Test (Airplanes with Shutoff Valves on External Servicing Panel)
(a) Close crew oxygen cylinder shutoff valve.
(b) Disconnect crew oxygen cylinder at connection between thermal compensator and high pressure line. Connect 0- to 2000-psi pressure gage to line connection.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR TO AVOID CONTAMINATION.

(c) Connect external pressure source to filler valve on external servicing panel. Set adjustment knob to 120°F. Open crew and close passenger oxygen external servicing shutoff valves.
(d) Disconnect one diluter demand regulator and connect 0 to 150 psi to line.

CAUTION: PLUG DILUTER DEMAND REGULATOR INLET TO AVOID CONTAMINATION.

(e) Open crew oxygen system shutoff valve in control cabin.
(f) Position all demand regulator supply levers to OFF.

(g) Slowly open external pressure source shutoff valve. Pressurize system to 1800 ±100 psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(h) After system pressure has stabilized, close external pressure source shutoff valve.
(i) Close crew oxygen system shutoff valve.
(j) Observe test pressure gages over a 15-minute period. There shall be no pressure drop on either gage.
(k) If pressure drops, check all connections, as necessary, using leak detection compound.
(l) Eliminate leaks and retest until satisfactory.
(m) Bleed oxygen pressure from system.
(n) Turn captain's diluter demand regulator supply lever to ON.
(o) Gain access to captain's oxygen mask.
1) Turn captain's diluter demand regulator emergency lever to ON and feel oxygen flowing through mask outlet. Wait until oxygen flow stops completely.
2) Turn emergency and supply levers to off.
(p) Remove 0 to 150 psi pressure gage and connect diluter demand regulator to line.
(q) Disconnect external pressure source. Bleed high pressure line and close crew oxygen external servicing shutoff valve.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(r) Remove 0- to 2000-psi pressure gage. Remove cylinder compensator protective cover and reconnect compensator to line.
(s) Slowly open crew oxygen cylinder shutoff valve.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(t) Open crew oxygen system shutoff valve.
(u) Perform a simplified leak test of the cylinder compensator connection and the diluter demand regulator connection per step B.

(3) Perform Leak Test (Airplanes without Shutoff Valves on External Servicing Panel)
(a) Close all crew and passenger oxygen cylinder shutoff valves.

(b) Disconnect crew oxygen cylinder at connection between thermal compensator and high pressure line. Connect 0 to 2000 psi pressure gage to line connection.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR TO AVOID CONTAMINATION.

(c) Slowly disconnect the passenger oxygen system high pressure line at system check valve inlet. Observe residual pressure warning, step (b).
(d) Apply pressure-tight cap to the high pressure line open end and protective cover to the check valve inlet.

NOTE: Steps (c) and (d) may be omitted if it is desired to leak test both crew and passenger oxygen systems at the same time. For passenger system test procedures, refer to 35-21-0 Adjustment/Test.

(e) Connect external pressure source to filler valve on external servicing panel. Set adjustment knob to 120°F.
(f) Disconnect one diluter demand regulator and connect 0- to 150-psi gage to line.

CAUTION: PLUG DILUTER DEMAND REGULATOR INLET TO AVOID CONTAMINATION.

(g) Open crew oxygen system shutoff valve in control cabin.
(h) Position all demand regulator supply levers to OFF.
(i) Slowly open external pressure source shutoff valve. Pressurize system to 1800 ±100 psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(j) After system pressure has stabilized, close external pressure source shutoff valve.
(k) Close crew oxygen system shutoff valve.
(l) Observe test pressure gages over a 15-minute period. There shall be no pressure drop on either gage.
(m) If pressure drops, check all connections, as necessary, using leak detection compound.
(n) Eliminate leaks and retest until satisfactory.

(o) Bleed oxygen pressure from system.
1) Turn captain's diluter demand regulator supply lever to ON.
2) Gain access to captain's oxygen mask.
3) Turn captain's diluter demand regulator emergency lever to ON.
4) Turn emergency and supply levers to OFF.

(p) Remove 0 to 150 psi pressure gage and connect diluter demand regulator to line.

(q) Disconnect external pressure source. Bleed high pressure line.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(r) Slowly remove pressure cap applied in step (d). Observe residual pressure warning, step (q). Remove protective cover on check valve inlet and reconnect high pressure line to check valve.

(s) Repeat step (e) and (i). Check connection for leaks between passenger oxygen system high pressure line and check valve using leak detection compound.

(t) Close external pressure source shutoff valves. Repeat step (q).

(u) Remove 0- to 2000-psi pressure gage. Remove cylinder compensator protective cover and reconnect compensator to line.

(v) Slowly open all crew and passenger oxygen cylinder shutoff valves.

WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(w) Open crew oxygen system shutoff valve.

(x) Perform a simplified leak test of the cylinder compensator connection and the diluter demand regulator connection per step B.

(4) Perform Leak Test (Airplanes without external servicing panel)

(a) Close crew oxygen cylinder shutoff valve.

(b) Disconnect crew oxygen cylinder at connection between thermal compensator and high pressure line.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR TO AVOID CONTAMINATION.

(c) Disconnect one diluter demand regulator and connect 0- to 150-psi gage to line.

CAUTION: PLUG DILUTER DEMAND REGULATOR INLET TO AVOID CONTAMINATION.

(d) Open crew oxygen system shutoff valve in control cabin.
(e) Position all demand regulator supply levers to OFF.
(f) Slowly open external pressure source shutoff valve. Pressurize system to 1800 ±100 psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(g) After system pressure has stabilized, close external pressure source shutoff valve.
(h) Close crew oxygen system shutoff valve.
(i) Observe test pressure gages over a 15-minute period. There shall be no pressure drop on either gage.
(j) If pressure drops, check all connections, as necessary, using leak detection compound.
(k) Eliminate leaks and retest until satisfactory.
(l) Bleed oxygen pressure from system.
    1) Turn captain's diluter demand regulator supply lever to ON.
    2) Gain access to captain's oxygen mask.
    3) Turn captain's diluter demand regulator emergency lever to ON and feel oxygen flowing through mask outlet. Wait until oxygen flow stops completely.
    4) Turn emergency and supply levers to OFF.
(m) Remove 0 to 150 psig pressure gage and connect diluter demand regulator to line.
(n) Disconnect external pressure source. Bleed high pressure line.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(o) Remove 0- to 2000-psi pressure gage. Remove cylinder compensator protective cover and reconnect compensator to line.
(p) Slowly open crew oxygen cylinder shutoff valve.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(q) Open crew oxygen system shutoff valve.
(r) Perform a simplified leak test of the cylinder compensator connection and the diluter demand regulator connection per step B.

D. Flight Crew Oxygen System Operation Test
(1) General
(a) The flight crew oxygen system operation may be tested using either an external pressure source or the cylinder in the system.
1) An external pressure source with a 0- to 2000-psi pressure gage as described below should be used if it is desired to test the indication system. To use this method it will be necessary to remove the oxygen cylinder.
2) The oxygen cylinder in the system may be used if reading of the high pressure indicator is omitted from the test.

NOTE: The oxygen cylinder pressure gage indicates approximate quantity of oxygen in the system during handling, transportation, etc., and is not suitable for testing the indication system because of possible reading error.

(b) On airplanes with external servicing panel, the external servicing connection cannot be used to pressurize the system for an operation test because the filler valve shuts off automatically once the preset pressure is reached, and no further servicing is allowed for 30 minutes.
(2) Equipment and Materials
(a) Pressure source (use one of the following):

NOTE: Use cylinder pressure of 700 to 1900 psi.

1) External pressure source. Refer to step 1.C.(1)(a).
2) Crew Oxygen Cylinder
(b) Pressure Gage, 0 to 2000 psi with an accuracy of ± 2% graduations not more than 100 psi apart, and a diameter of not less than 4 inches
(3) Prepare System for Testing
(a) If external pressure source is to be used, proceed as follows:
1) Remove crew oxygen cylinder (Ref 12-15-21).
2) Connect pressure source and 0- to 2000-psi pressure gage to cylinder coupling.
(4) Test Flight Crew Oxygen System Operation
(a) If indication system is going to be tested provide electrical power and close OXY IND & VALVE circuit breaker on panel P18.
(b) Check that crew oxygen system shutoff valve is open.

(c) Slowly open external pressure source shutoff valve or crew oxygen cylinder shutoff valve.

WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(d) If indication system is being tested, record reading of high pressure indicators on aft overhead panel and (on airplanes so equipped) on external servicing panel. It shall be within ± 100 psi of pressure source gage reading.
(e) On captain's diluter demand regulator, turn supply and emergency levers to ON.
(f) Oxygen should flow through mask.
(g) Turn emergency and supply levers to OFF.
(h) Repeat steps (e), (f), and (g), at other crew stations in turn.
(i) If external pressure source has been used close its shutoff valve, remove, and install crew oxygen cylinder (Ref 12-15-21).
(j) Open crew oxygen system shutoff valve.

NOTE: System is now in operative condition.

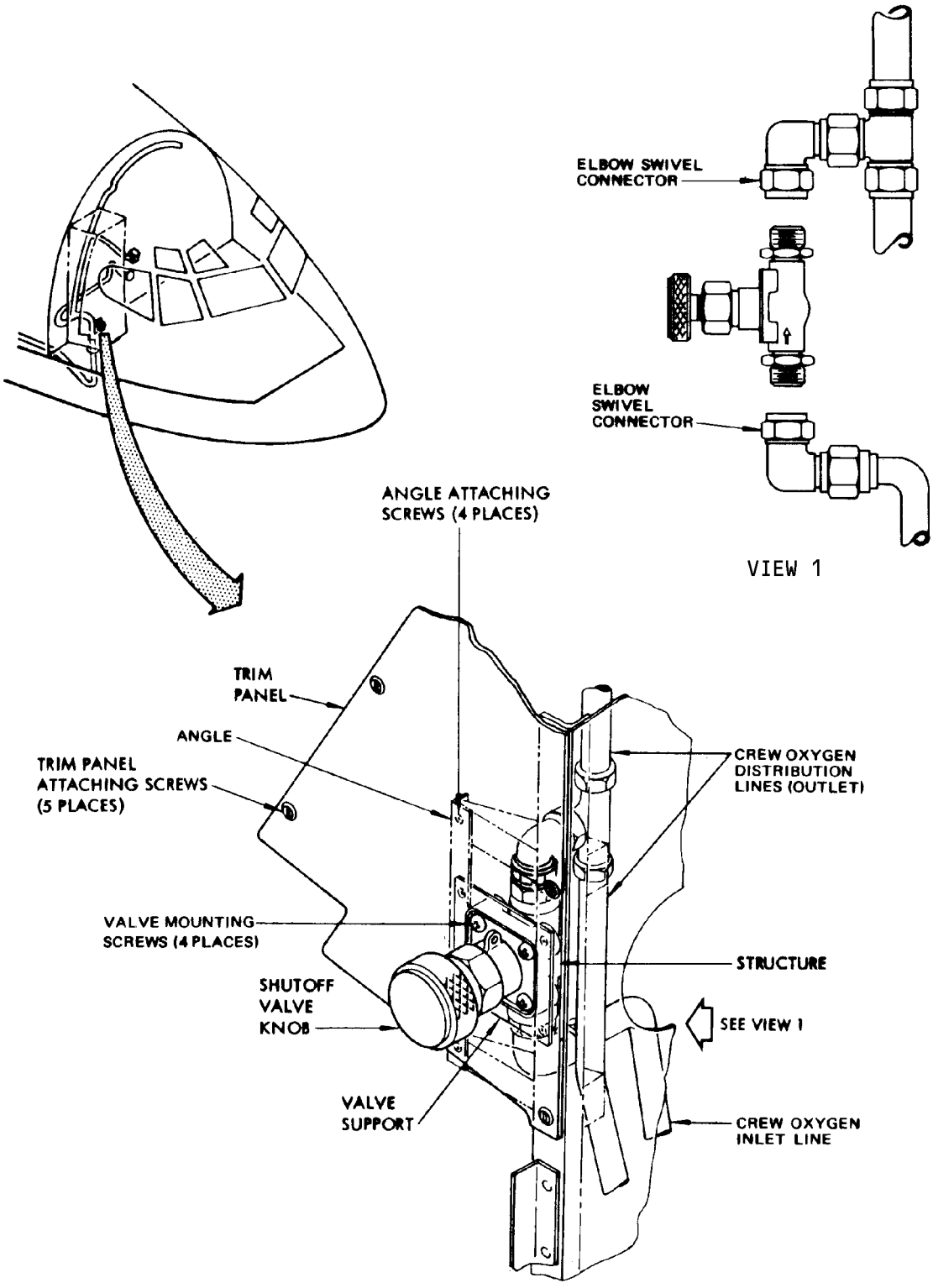
(k) If no longer required, remove electrical power.

CREW OXYGEN SHUTOFF VALVE - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Oxygen System Leak Detection Compound, Specification MIL-L-25567 or equivalent.
2. Remove Shutoff Valve
   A. In forward cargo compartment, close crew cylinder shutoff valve.
   B. Loosen knob set screw, then remove shutoff valve knob. (See figure 401.)
   C. Remove insulation as necessary to gain access to shutoff valve area.
   D. Remove trim panel.
      (1) Remove equipment where necessary.
      (2) Remove trim panel attaching screws and remove panel.
   E. Remove angle attaching screws and remove angle.
   F. Disconnect inlet and outlet lines at the elbow swivel connections attached to the valve unions. Residual pressure in lines will cause oxygen to escape.
   G. Remove screws attaching valve support to structure. Remove valve support and valve attached together.
   H. Remove valve mounting screws and remove valve from valve support.
   I. Remove unions and O-rings from valve and install plugs in valve ports.
   J. Plug inlet and outlet lines to prevent contamination of oxygen system.
3. Install Shutoff Valve
   A. Open valve and remove valve knob and port plugs if installed.
   B. Attach unions with new O-rings to valve.
   C. Attach valve to valve support with mounting screws.
   D. Remove plugs from inlet and outlet lines.
   E. Position valve support and valve attached together. Connect inlet and outlet lines.
   F. Install screws attaching valve support to structure.
   G. In forward cargo compartment, slowly open crew oxygen cylinder shutoff valve.

      WARNING: VALVE MUST BE OPENED SLOWLY TO AVOID TEMPERATURE RISE.

   H. Observe crew oxygen pressure gage to be certain system is pressurized.
   I. Check for leaks, using mirrors, if necessary, as an aid in leak detection. (Refer to 35-11-0, Adjustment/Test.)
   J. Install angle.
   K. Install trim panel.
   L. Reposition insulation against panel.
   M. Install shutoff valve knob, tighten knob set screw, and leave valve open.



Crew Oxygen Shutoff Valve Installation
Figure 401

CREW OXYGEN PRESSURE REDUCING REGULATOR - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Oxygen system leak detection compound (Ref 20-30-51)
2. Remove Regulator (Fig. 401)
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
   B. Gain access to oxygen cylinders.
   C. Close crew oxygen cylinder shutoff valve.
   D. Disconnect thermal compensator B-nut at upstream end.

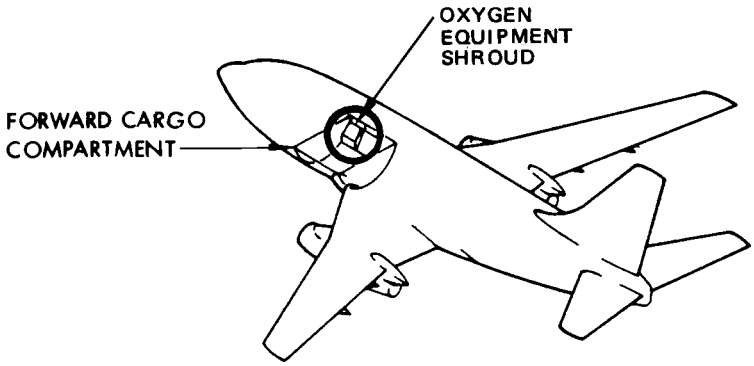
      WARNING: RESIDUAL PRESSURE IN HIGH PRESSURE LINE IS 1800 PSI AND OXYGEN WILL ESCAPE WITH SOME FORCE

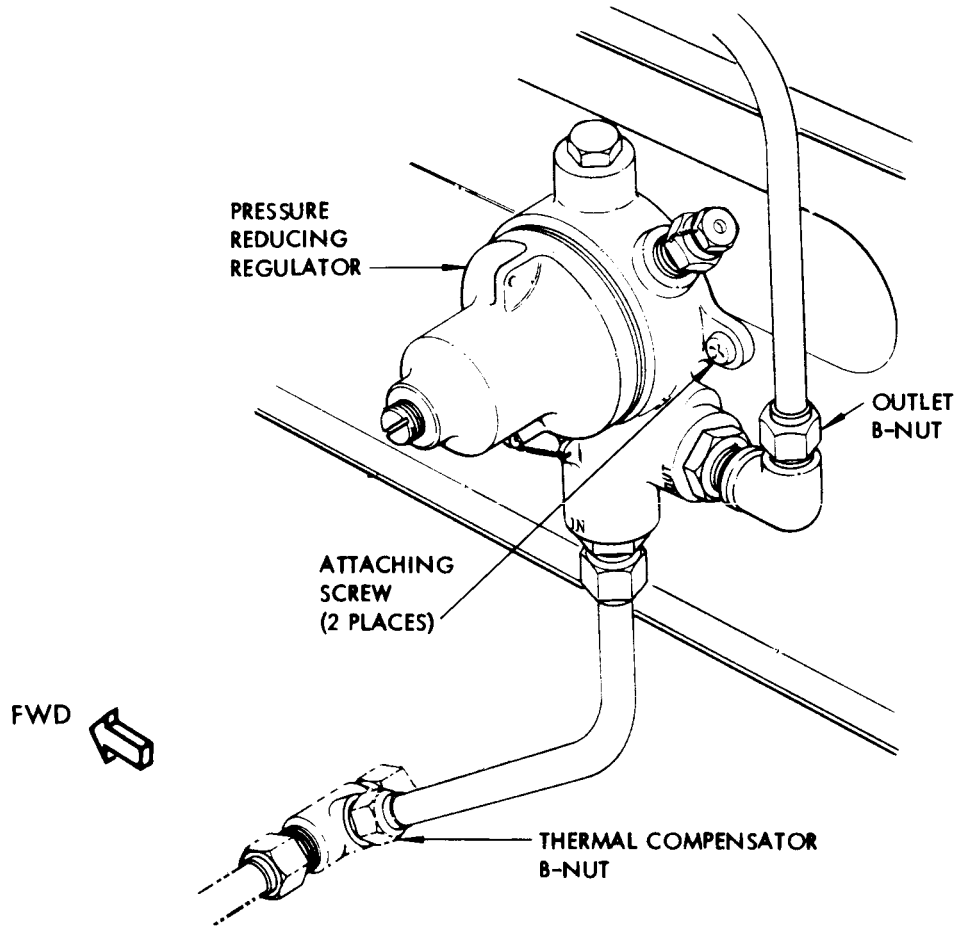
   E. Disconnect outlet B-nut from regulator.
   F. Remove two screws attaching regulator to support.
   G. Remove regulator and compensator assembly attached together. Cap open connections.
   H. Disconnect regulator from compensator assembly (Ref 35-09-100).
3. Install Regulator (Fig. 401)
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
   B. Attach regulator to compensator assembly (Ref 35-09-100).
   C. Check crew oxygen cylinder shutoff valve and crew oxygen system shutoff valve are closed.
   D. Place regulator in mounting position and restore line connections.
   E. Attach regulator to support with two screws.
   F. Slowly open crew oxygen cylinder shutoff valve.

      WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT

   G. Check regulator connections for leaks using leak detection compound.
   H. Slowly open crew oxygen system shutoff valve.

      WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT





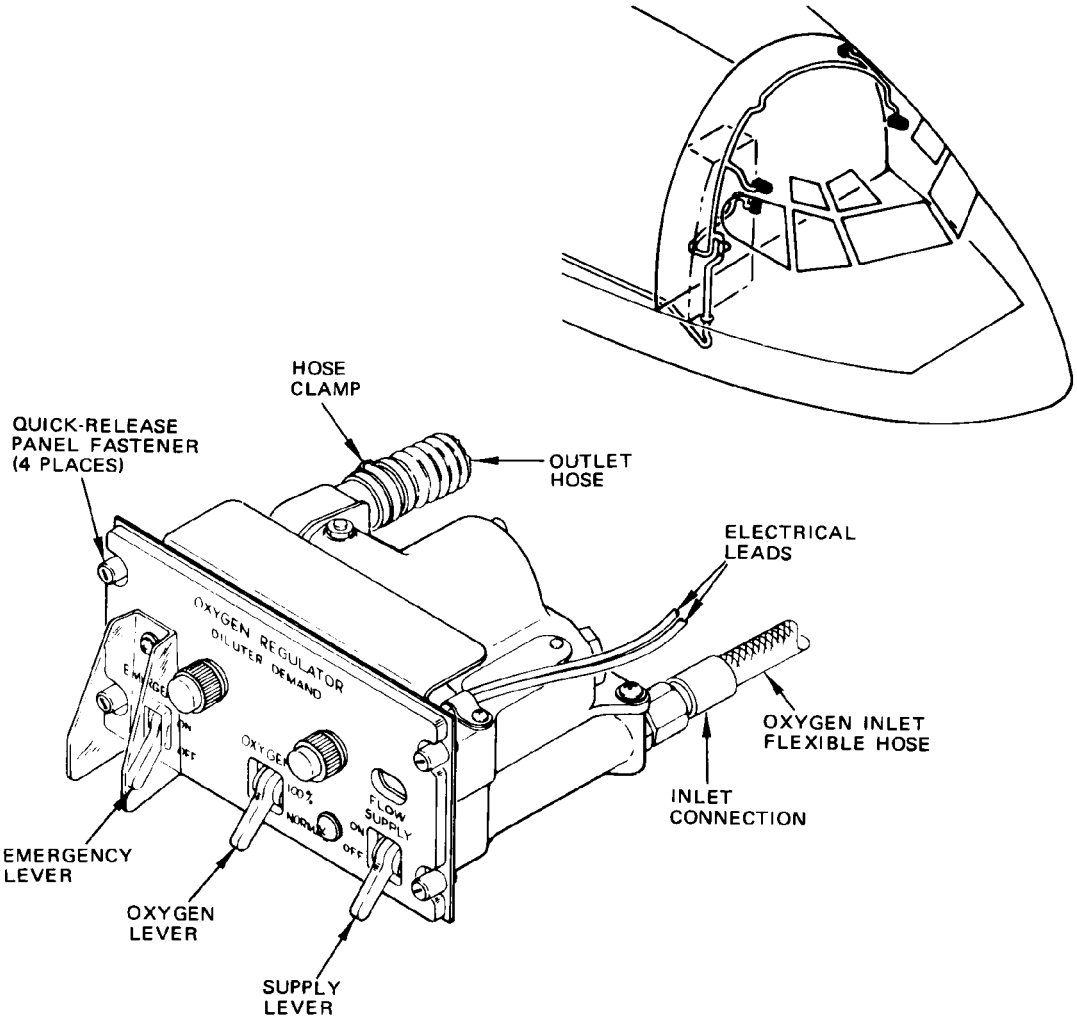
Pressure Reducing Regulator Installation
Figure 401

CREW DILUTER DEMAND REGULATOR - REMOVAL/INSTALLATION

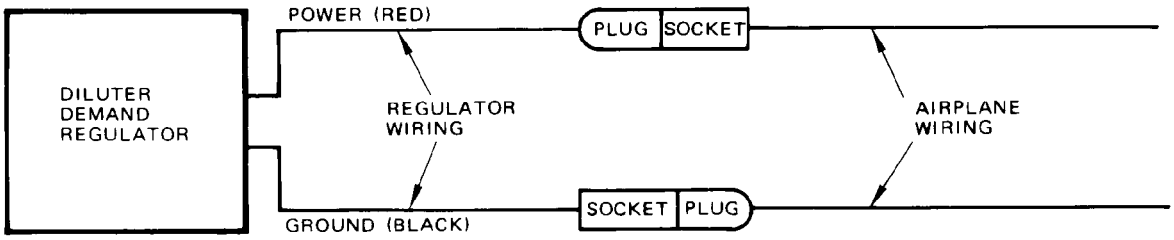
1. General
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00 MP.
2. Equipment and Materials
   A. Oxygen leak detection compound (Ref 20-30-51)
3. Prepare for Diluter Demand Regulator Removal
   A. Close crew oxygen system shutoff valve.
   B. For captain's and second observer's regulator open PANEL & INSTRUMENT 28V PRIMARY CAPT & CTR circuit breaker on P6-3. For first officer's and first observer's regulator open PANEL & INSTRUMENT 28V PRIMARY F/O circuit breaker on P6-3.
4. Remove Diluter Demand Regulator (Fig. 401)
   A. Release quick-release panel fasteners and displace regulator from position.
   B. Disconnect inlet and outlet hoses. Install protective caps to regulator ports and oxygen hoses to prevent contamination of system.
   C. Disconnect electrical connections and remove regulator.
5. Install Diluter Demand Regulator (Fig. 401)
   A. Check that all switches on regulator are pointing down.
   B. Remove protective caps, and connect inlet and outlet hoses to regulator ports.
   C. Restore electrical connections (Fig. 401).
      (1) Install plug and socket on regulator wires and make connection.

      CAUTION: IF WIRES ARE CROSS-CONNECTED, DAMAGE TO REGULATOR AND/OR INLET HOSE MAY RESULT.

   D. Close circuit breaker.
   E. Slowly open oxygen system shutoff valve to pressurize system. Check gages.
   F. Check for leaks using oxygen system leak detection compound.
   G. Hold regulator in mounting position and secure dzus fasteners.
   H. Check regulator operation (Ref 35-11-41 I/C).



Diluter Demand Regulator Installation (Typical)
Figure 401



Diluter Demand Regulator Electrical Connection
Figure 401

CREW DILUTER DEMAND REGULATOR - INSPECTION/CHECK

1. General The following procedure is to check functioning of the regulator controls and indicator. It is more extensive than the normal system test, and is required following installation of a regulator or when regulator serviceability is in doubt.
2. Check Diluter Demand Regulator
   A. Provide electrical power and close OXY IND & VALVE circuit breaker on panel P18.
   B. Check that crew oxygen system shutoff valve is open.
   C. Inspect mask, hose and fittings for grease or damage.
   D. Hold mask away from face and select supply lever ON, oxygen lever 100% and emergency lever ON. Verify Flow indicator shows flow and oxygen flows from mask.
   E. Select emergency and supply lever OFF.
   F. Adjust mask to face and inhale once. Verify mask pulls to face.
   G. Select oxygen lever to NORMAL and inhale. Verify unrestricted flow of air. The oxygen flow indicator should show no flow.
   H. Select supply lever ON. Inhale and verify flow indicator shows little or no flow unless airfield altitude is above 5000 ft.
   I. Select oxygen lever to 100% and inhale. Verify flow indicator shows flow.
   J. Select emergency lever ON and verify there is a slight pressure in mask. Return emergency lever to NORMAL.
   K. Clean and stow oxygen mask.
   L. If no longer required, remove electrical power.

CREW OXYGEN SERVICING SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure applies to both the crew and passenger oxygen systems external servicing shutoff valves.
2. Equipment and Materials
   A. High pressure oxygen storage cylinders and ground servicing equipment (Refer to 12-15-21, Oxygen Servicing.)
   B. Oxygen System Leak Detection Compound - Specification MIL-L-25567
3. Remove Servicing Shutoff Valve
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions. (Refer to 35-00, Maintenance Practices.)
   B. On airplane exterior, release latches and open oxygen servicing panel access door.
   C. Remove shutoff valve knob.
   D. Remove mounting screws.
   E. Close and latch oxygen servicing panel access door.
   F. Disconnect line connections from valve as follows:
      (1) Disconnect B nut at end of compensator assembly away from valve. (See figure 401.)

      WARNING: RESIDUAL PRESSURE IN HIGH PRESSURE LINE COULD BE AS HIGH AS 1800 PSI AND OXYGEN WOULD EXCAPE WITH SOME FORCE.

      (2) Disconnect outlet line B nut from servicing shutoff valve.
      (3) Remove valve and compensator assembly attached together.
      (4) Disconnect valve from compensator assembly. (Refer to 35-09-100, Thermal Compensator Assemblies - Removal/Installation.)
      (5) Install protective caps to valve ports and open lines to prevent contamination of system.
4. Install Servicing Shutoff Valve
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions. (Refer to 35-00, Maintenance Practices.)
   B. Remove protective caps from airplane lines and valve ports.
   C. Attach valve to compensator assembly with valve flow arrow pointing toward compensator assembly. (Refer to 35-09-100, Thermal Compensator Assemblies - Removal/Installation.)

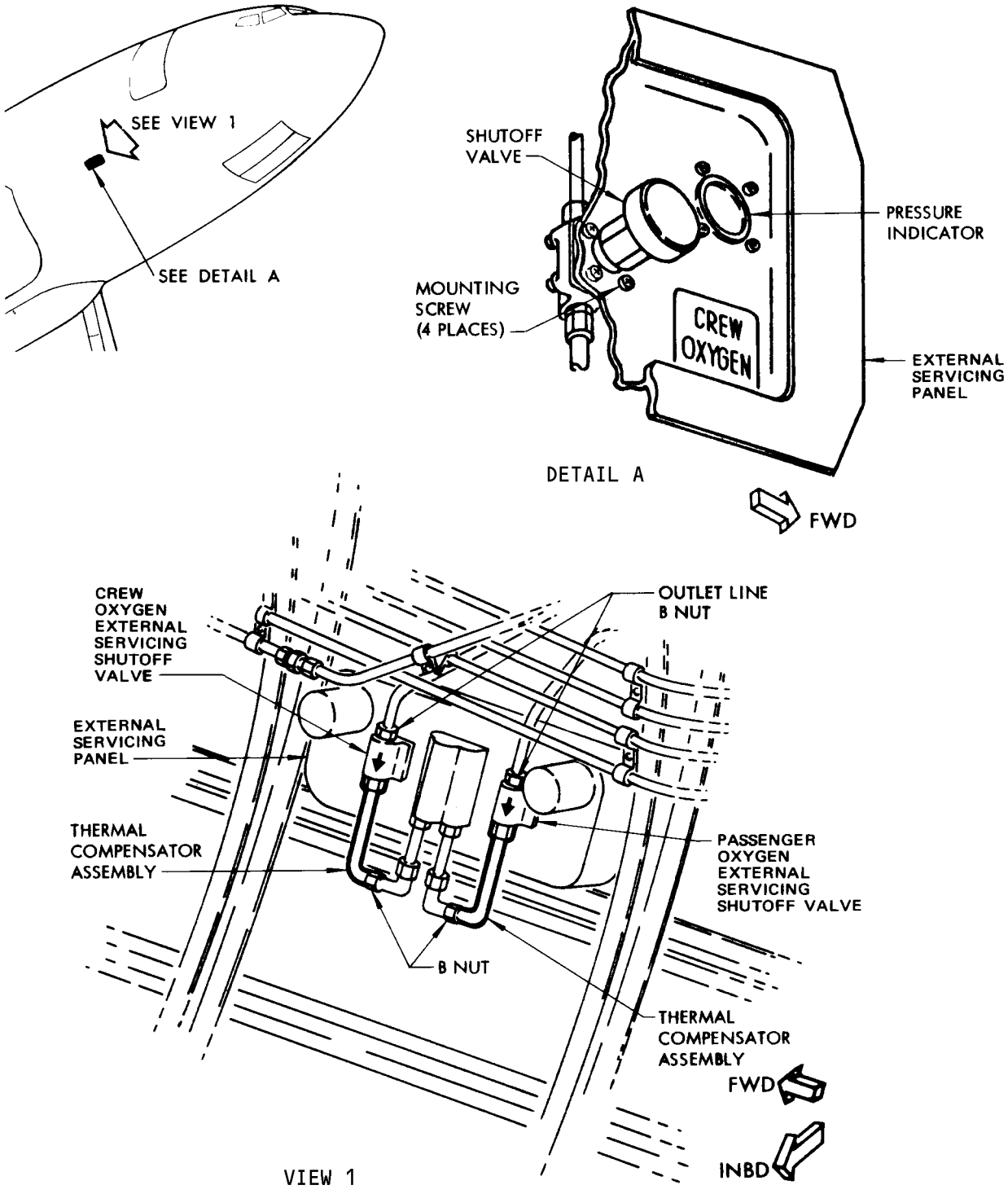
      CAUTION: IF ARROW POINTS AWAY FROM COMPENSATOR, VALVE MAY LEAK IN SERVICE.

   D. Position shutoff valve and loosely connect inlet and outlet lines. (See figure 401.)

E. On airplane exterior, release latches and open external servicing panel access door.
F. Install screws to attach shutoff valve to panel.
G. Install shutoff valve knob, tighten knob setscrew, and leave valve open.
H. In airplane interior, tighten line connections.
I. Check for leaks in line connections to filler valve.
   (1) Connect ground servicing equipment pressure line to filler valve and service onboard oxygen cylinders to maximum permissible pressure obtained by filler valve temperature adjustment dial setting. (Refer to 12-15-21, Oxygen Servicing.)

       NOTE: Limit pressure will be reached in a very short time and filler valve will close automatically.

   (2) Close ground servicing equipment shutoff valve.
   (3) In airplane interior, check for leaks using leak detection compound.
   (4) Close shutoff valve.
   (5) Remove ground servicing equipment, cap filler valve, and close and latch oxygen servicing panel access door.



Servicing Shutoff Valve Installation
Figure 401

CREW OXYGEN PRESSURE INDICATOR - REMOVAL/INSTALLATION

1. General
   A. This procedure applies to both the crew and passenger oxygen systems pressure indicators located on the external servicing panel.
2. Remove Oxygen Pressure Indicator
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00 Maintenance Practices.
   B. Open OXYGEN IND & VALVE circuit breaker on panel P18-4 center.
   C. In airplane interior, tag and disconnect electrical connector.

      CAUTION: CROSS CONNECTION OF ELECTRICAL CONNECTORS MAY OCCUR WHEN WORKING WITH THE CREW AND PASSENGER OXYGEN PRESSURE INDICATORS ON THE EXTERNAL SERVICING PANEL. CLEARLY IDENTIFY ELECTRICAL CONNECTORS BEFORE DISCONNECTING.

   D. Remove nuts, indicator, and gasket. (See figure 401.)
   E. On airplane exterior, open external servicing panel access door.
   F. Remove bolts.
3. Install Oxygen Pressure Indicator
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00 Maintenance Practices.
   B. Insert mounting bolts from exterior side of panel (Fig. 401).
   C. On interior side, position gasket and indicator and install nuts.
   D. Connect electrical connector as tagged.

      CAUTION: CROSS CONNECTION OF ELECTRICAL CONNECTORS MAY OCCUR WHEN WORKING WITH THE CREW AND PASSENGER OXYGEN PRESSURE INDICATORS ON THE EXTERNAL SERVICING PANEL. RECONNECT ELECTRICAL CONNECTOR AS TAGGED AND PERFORM OPERATIONAL CHECKOUT DESCRIBED BELOW.

   E. Energize 28 VOLTS DC battery bus.
      (1) Place BATTERY switch on aft overhead panel in ON position.
      (2) Close HOT BATTERY BUS circuit breaker on panel P6-6.
   F. Close OXYGEN IND & VALVE circuit breaker on panel P18-4.
   G. Check that indicator shows oxygen pressure reading.
   H. Close external servicing panel access door.
   I. De-energize battery bus.

CREW OXYGEN PRESSURE TRANSDUCER - REMOVAL/INSTALLATION

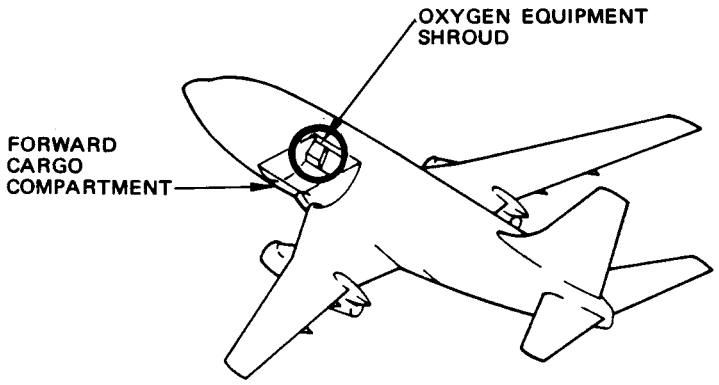
1. General
   A. The crew oxygen pressure transducer is located in the upper, aft corner of the oxygen equipment shroud enclosure. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen System Leak Detection Compound (Ref 20-30-51).
3. Remove Pressure Transducer (Fig. 401)
   A. Open OXYGEN IND & VALVE circuit breaker on P18 panel.
   B. In forward cargo compartment, open oxygen equipment shroud door and secure in open position.
   C. Close crew oxygen cylinder shutoff valve.
   D. Disconnect transducer electrical connector.
   E. Disconnect and cap line and connection.

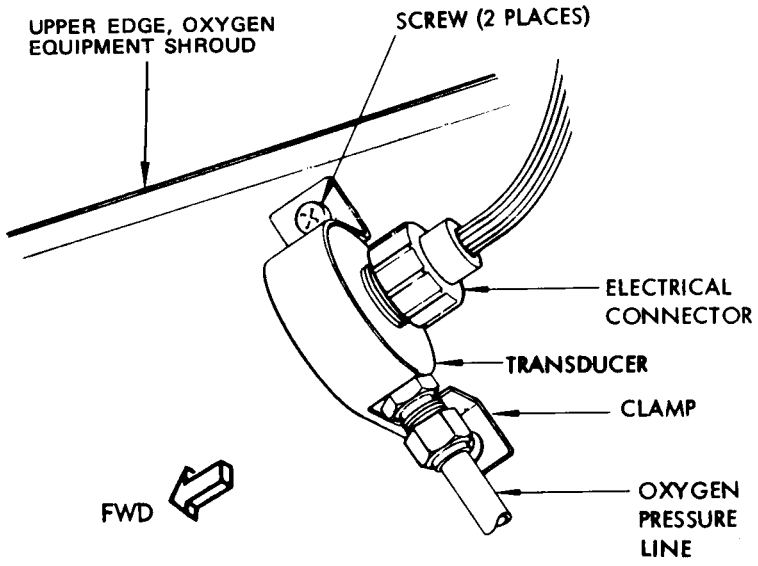
      WARNING: RESIDUAL PRESSURE IN HIGH PRESSURE LINE COULD BE AS HIGH AS 1800 PSI AND OXYGEN COULD ESCAPE WITH SOME FORCE.

   F. Loosen clamp and remove transducer.
4. Install Pressure Transducer (Fig. 401)
   A. Position transducer, remove caps and connect line.
   B. Connect electrical connector.
   C. Tighten clamp.
   D. Slowly open crew oxygen cylinder shutoff valve.

      WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

   E. Check transducer connection for leakage using leak detection compound.
   F. Provide electrical power (Ref 24-22-0, MP).
   G. Close OXYGEN IND & VALVE circuit breaker on P18 panel.
   H. Check that crew oxygen pressure indicator on aft overhead panel shows pressure.
   I. Remove electrical power if no longer required (Ref 24-22-0, MP).





Crew Oxygen Pressure Transducer Installation
Figure 401

OXYGEN SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The passenger oxygen system supplies oxygen automatically to each passenger, cabin attendant's station, and lavatory whenever the cabin pressure is reduced to a value equivalent to an altitude of approximately 14,000 feet or higher. The system consists of one oxygen cylinder assembly, two continuous flow control units, oxygen distribution lines, pressure indicators, pressure latch-valve-manifold assemblies, and oxygen masks stowed in passenger service units. (See figure 1.) System operation can be initiated by any of three methods: automatically by actuation of the aneroid-operated device in either or both of the continuous flow control units, electrically by a switch on the aft overhead panel controlling the electro-pneumatic continuous flow control unit, or manually by pulling the handle controlling the pneumatic continuous flow control unit. The handle is located in a recess in the control cabin floor just aft of the control stand.
   B. On passenger/cargo convertible airplanes, a manually actuated passenger oxygen system shutoff valve is provided to interrupt oxygen flow to all service units in the passenger cabin except the forward lavatory and forward attendant's service units.
      (1) When an airplane is used in the standard passenger configuration or is used to carry passengers and cargo in any combination, the passenger oxygen system shutoff valve must be open to pressurize all service units.
      (2) When an airplane is converted to all cargo configuration, the passenger oxygen system should be deactivated by closing the shutoff valve.
   C. The portion of the system upstream of the continuous flow control units is designated the high pressure side and utilizes stainless steel tubing and fittings. The portion downstream of the units is designated the low pressure side and utilizes stainless steel tubing and fittings inside the oxygen cylinder shroud area with aluminum tubing and fittings downstream of the shroud area.
   D. Cylinder pressure is shown by a pressure indicator on the aft overhead panel. The pressure indicator receives signals from a pressure transducer in the electro-pneumatic continuous flow control unit. Cylinder pressure gives an indication of the quantity of oxygen available. Each oxygen cylinder is equipped with a safety relief valve to discharge cylinder contents overboard when cylinder pressure exceeds a safe limit.
2. Passenger Oxygen Cylinder
   A. The oxygen cylinder assembly has a capacity of 114 cubic feet (3225 liters) of standard oxygen compressed to 1850 psi at 70°F. The cylinder is mounted in the forward cargo compartment with the crew oxygen system cylinder. (See figure 1.)

B. The passenger cylinder assembly includes a slow opening shutoff valve, pressure gage, and safety relief valve to discharge cylinder contents overboard when cylinder pressure exceeds a safe limit. The safety relief valves are manifolded to a line connected to an overboard discharge port in the airplane skin. The overboard discharge line serves both the passenger and crew systems.

C. High pressure supply oxygen feeds two continuous flow control units.

3. Passenger Oxygen Continuous Flow Control Units

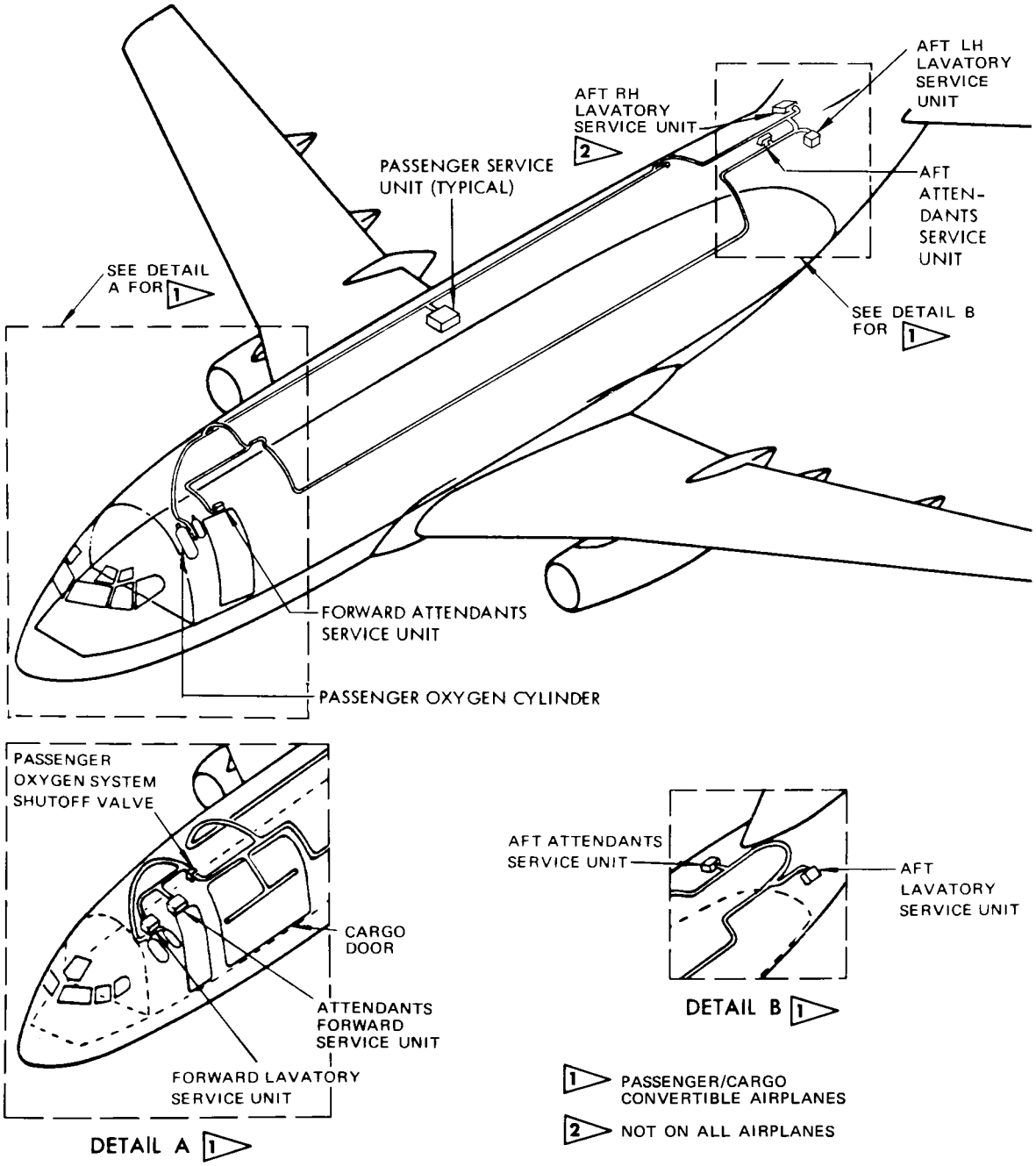
A. The passenger oxygen system includes two continuous flow control units, an electropneumatic and a pneumatic, connected in parallel to provide a means of initiating flow into the passenger oxygen system (Fig. 2). Each control unit is independently capable of supplying the passenger oxygen system. The control units are installed on a bracket between the crew and passenger oxygen cylinders.

B. Electropneumatic Continuous Flow Control Unit

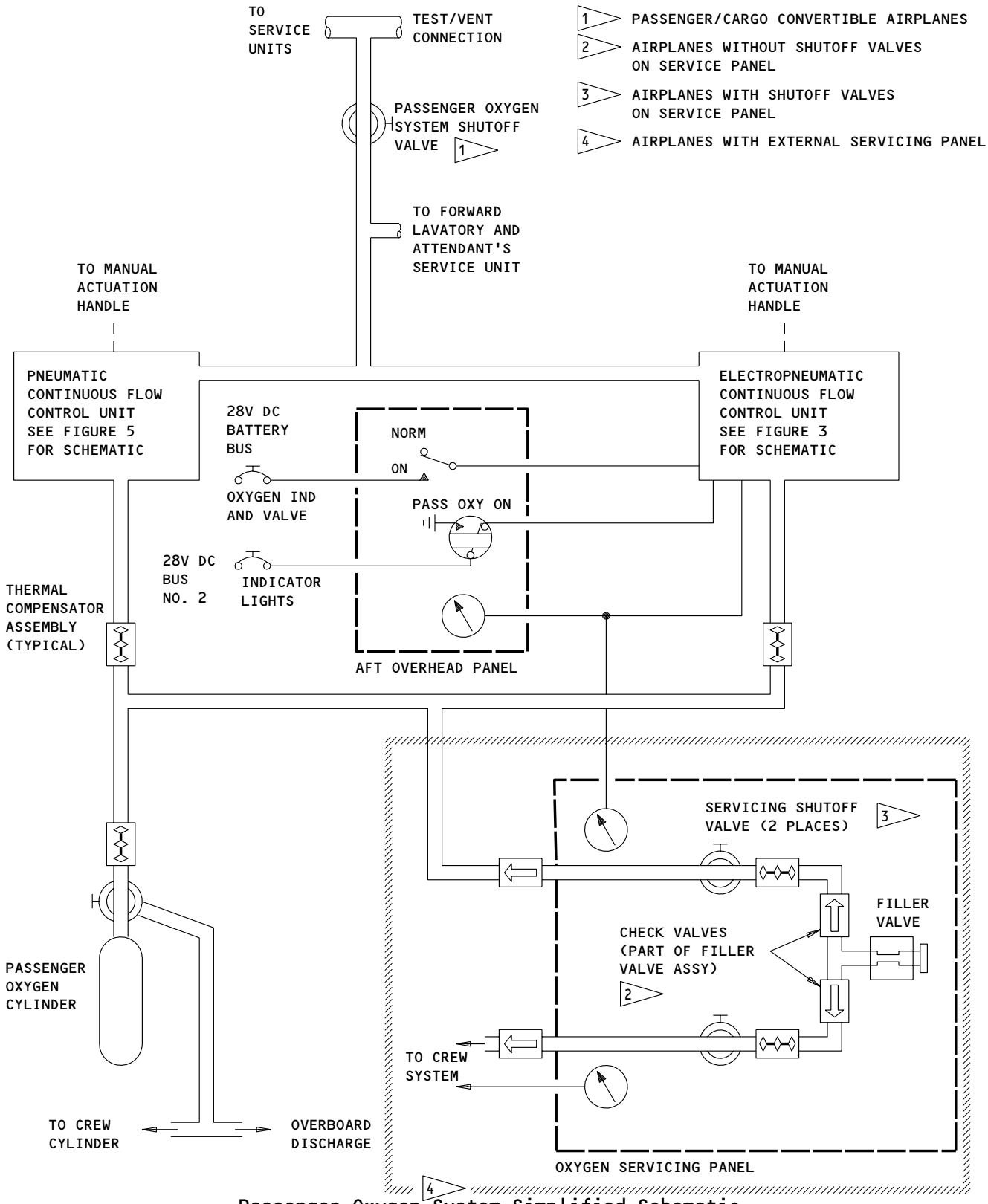
(1) The electropneumatic continuous flow control unit consists of a pressure reducer, actuation valve, and main flow control valve (Fig. 3). The actuation valve may be operated by an automatic aneroid mechanism or by a solenoid-controlled actuator energized through a switch on the aft overhead panel. The unit is reset manually by the manual actuation handle located in a recess on the control cabin floor just aft of the control stand. The manual actuation handle is connected by a cable to two levers, one on each continuous flow control unit.

(2) The manual actuation handle has three positions, ON, OFF, and RESET. (Fig. 4) When positioned to ON, a detent holds the handle.

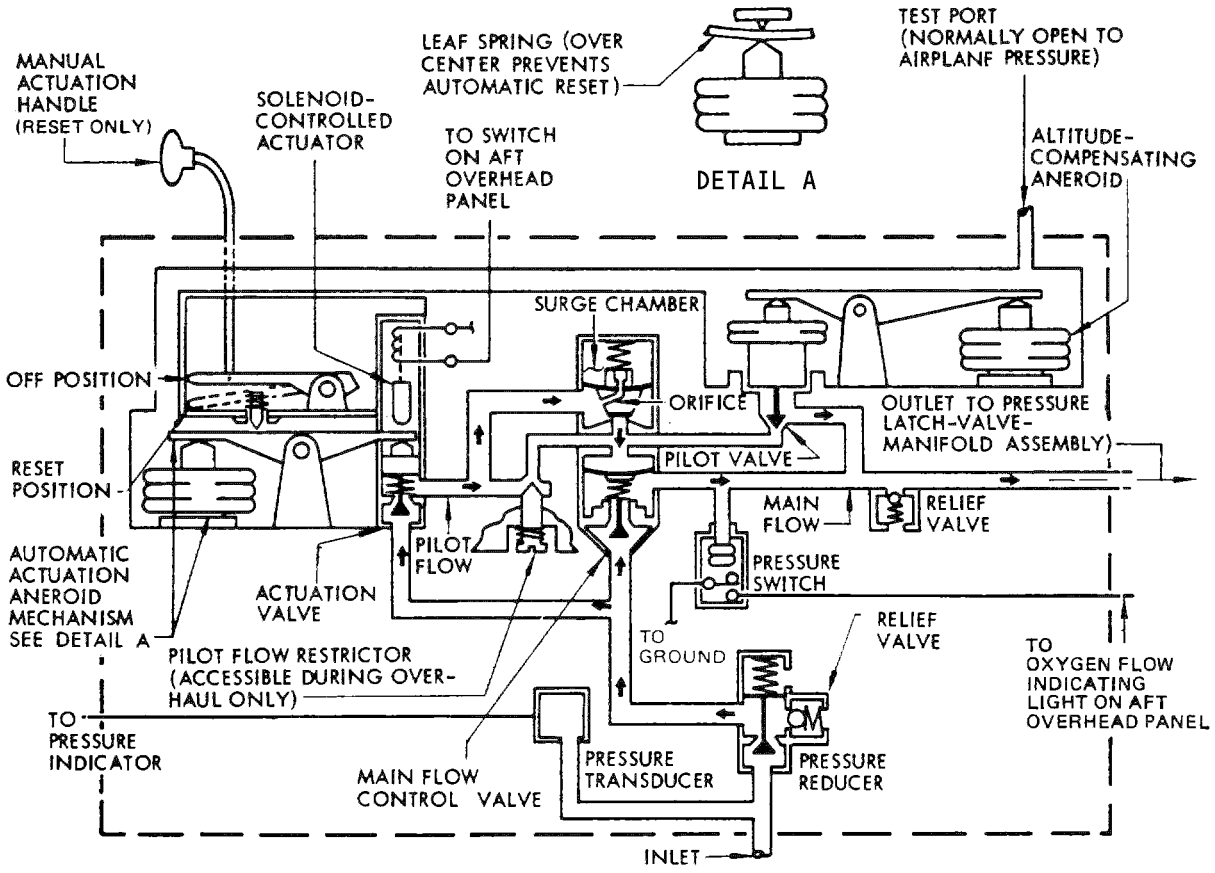
(3) Oxygen pressure is lowered by the pressure reducer from 1850 psig to 100 psig (nominally). The automatic actuation aneroid mechanism opens the actuation valve at 14,000 feet cabin altitude with increase of cabin altitude. Downstream from the actuation valve are a main flow control valve and a pilot valve. The main flow control valve controls flow of oxygen to the low pressure side of the system. The main flow control valve opening is controlled by a diaphragm, which deflects under pressure provided by the pilot flow. This pressure is controlled by the pilot valve, which is connected to two altitude-compensating aneroids. These aneroids sense cabin altitude, and cause more oxygen to flow to the masks as altitude increases, and less oxygen as altitude decreases.



Passenger Oxygen System Components Location
Figure 1



Passenger Oxygen System Simplified Schematic
Figure 2



Electropneumatic Continuous Flow Control Unit Schematic
Figure 3

(4) The main flow control valve has a surge chamber which causes the unit to provide a pressure surge of 50 to 100 psig for 7 to 15 seconds. This pressure surge is released when oxygen, entering the surge chamber, deflects a diaphragm against spring pressure, and opens a valve momentarily increasing the pressure provided by the pilot flow, thus causing the main flow control valve to open widely. The pressure surge actuates the latch-valve-manifold assemblies, opening the passenger service unit doors and allowing the masks to drop. After 7 to 15 seconds, oxygen, flowing through an orifice, fills the surge chamber on both sides of the diaphragm. With pressure thus equalized, spring action returns the diaphragm to its normal position, ending the pressure surge.

(5) The high pressure side of the unit contains a pressure transducer functionally identical with that described in the Flight Crew Oxygen System and electrically connected to two pressure indicators, one on the external servicing panel and one on the aft overhead panel. (See figure 2.)

(6) The low pressure side of the unit contains a pressure switch which completes a circuit to an amber light on the aft overhead panel, indicating that the low pressure distribution system is pressurized.
(a) The light comes on, with increasing pressure, at 20 (+ 10) psi.
(b) The light goes off , with decreasing pressure, at 1-1/2 (+ 1/2) psi.

C. Pneumatic Continuous Flow Control Unit

(1) The pneumatic continuous flow control unit includes major features of the electropneumatic unit described above, namely a pressure reducer, automatic aneroid actuation, and continuous flow control regulator. (See figure 5.)

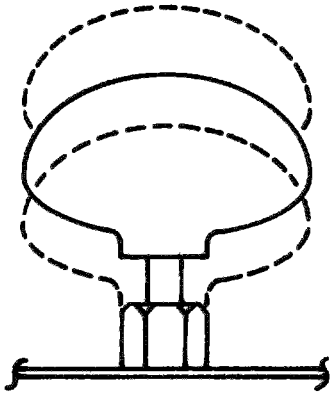
(2) A manual on, off, and reset mechanism is connected in parallel with the aneroid actuation mechanism and actuated by the handle on the control cabin floor. (For handle operation, see figure 4.) The unit must always be reset manually.

(3) Other differences between the two units are that the pneumatic unit does not have a pressure transducer or pressure switch and can not be operated electrically.

(4) Operation is identical to that of the electropneumatic continuous flow control unit except that the actuation valve is operated manually instead of electrically.

4. Low Pressure Distribution Line and Overboard Discharge Line

A. Low pressure oxygen is supplied from the continuous flow control units to a feeder manifold on each side of the fuselage. Flexible hoses are attached along each manifold, at twenty inch intervals, for delivery of oxygen to passenger service units.



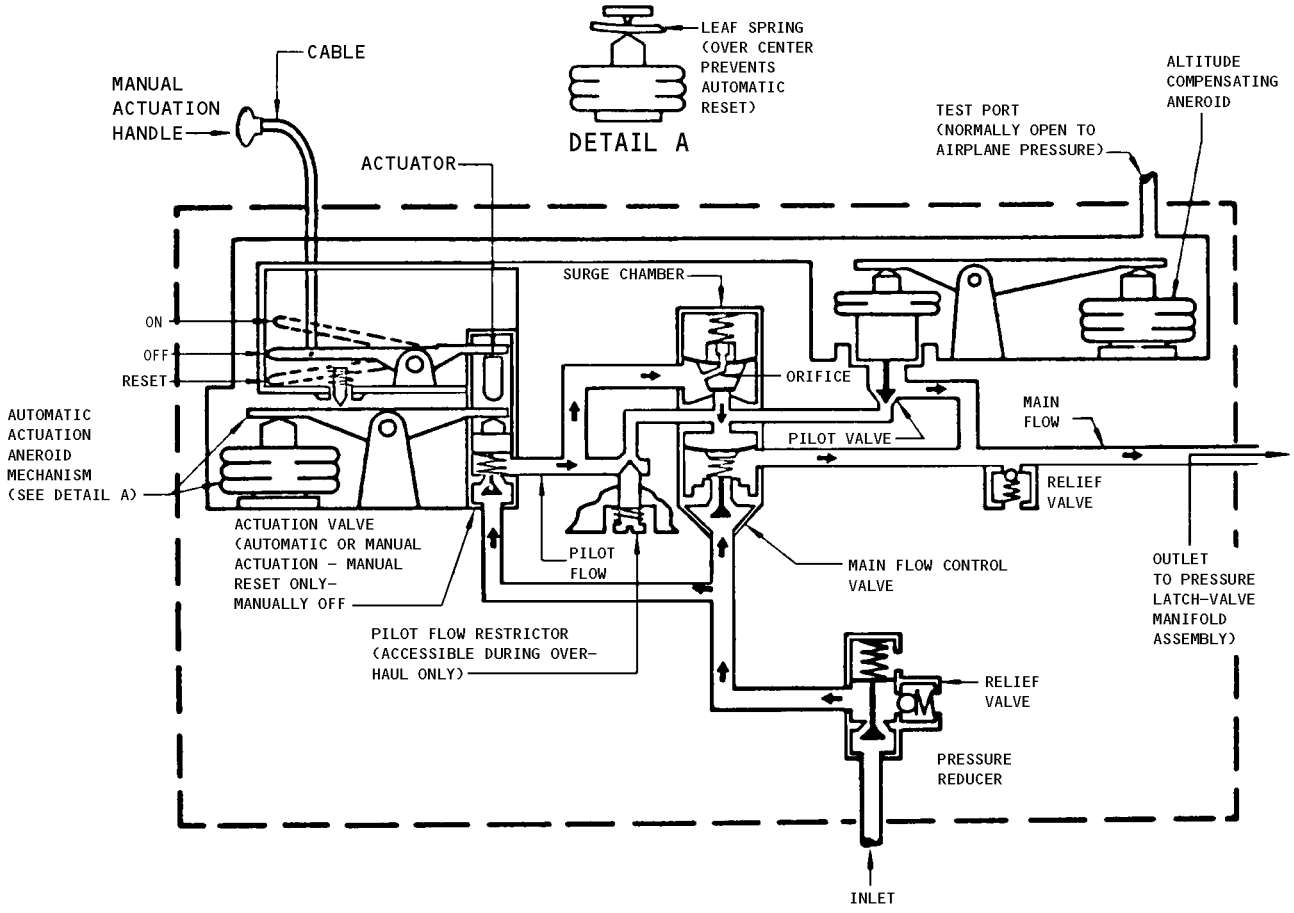
3 POSITIONS

ON: PNEUMATIC UNIT TURNED ON; ELECTROPNEUMATIC UNIT NOT AFFECTED

OFF: OFF (NEUTRAL) POSITION; NEITHER UNIT AFFECTED

RESET: PNEUMATIC UNIT RESET AND ELECTROPNEUMATIC UNIT RESET (TO RESET HOLD FOR 5 SECONDS AND RETURN TO OFF)

Continuous Flow Control Units Manual Actuation Handle
Figure 4



Pneumatic Continuous Flow Control Unit Schematic
Figure 5

B. The low pressure line contains two test/vent connections for venting oxygen pressure accumulated by leakage and purging the low pressure tubing of air in the event the oxygen system is operated. The test/vent connections also provide a means of connecting a low pressure source and gage for testing the low pressure line. When the passenger system is in use, the sound of air escaping from the test vents is audible.

CAUTION: THE TEST/VENT CONNECTIONS SHOULD BE UNCAPPED AT ALL TIMES EXCEPT WHEN PERFORMING LOW PRESSURE TUBING LEAKAGE TESTS.

C. The overboard discharge line and discharge port in the airplane skin is common with that of the crew oxygen cylinder. The overboard discharge port incorporates an indicator (plastic disc) which normally prevents dirt, grease, etc., from entering the discharge line. The indicator blows out at a pressure of 500 psi to allow oxygen to discharge overboard.

5. Passenger Service Units

A. Passenger service units (PSU), mounted in the seating area, the lavatories, and the attendants' stations, contain stowage space for the oxygen masks, the mechanism for automatic release of masks, and oxygen distribution and shutoff equipment. (See figure 6.)

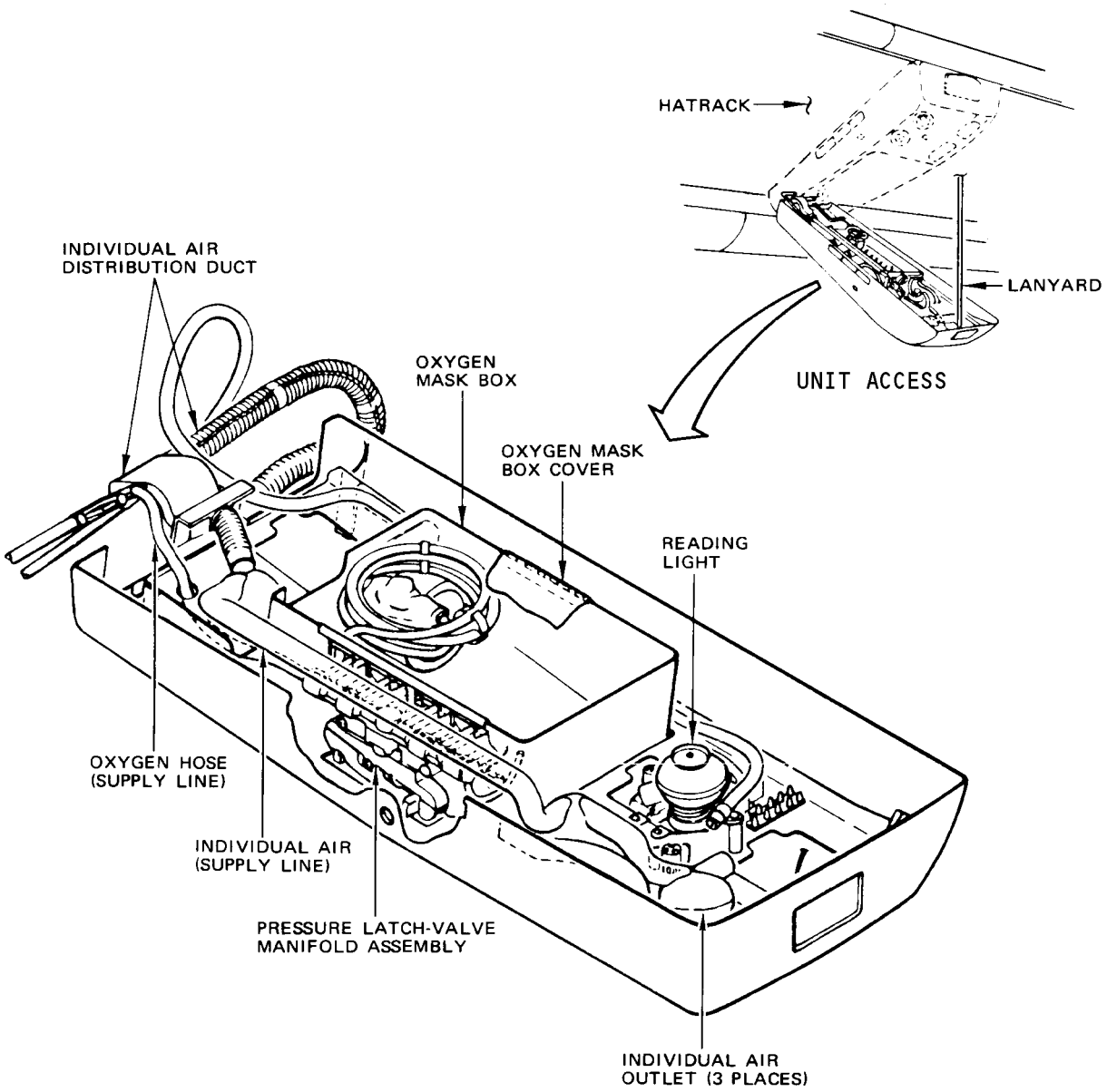
B. Oxygen is supplied to each passenger service unit through a flexible plastic hose, connecting feeder manifold outlets with the distribution manifolds in the service unit.

6. Passenger Service Unit Pressure Latch-Valve-Manifold Assembly

A. The pressure latch-valve-manifold assembly retains the oxygen mask box door which holds oxygen masks in a stowed (installed) position in each service unit. (See figure 7.) The assembly is actuated and releases the masks when pressure in the low pressure section of the oxygen distribution line rises to approximately 20 psi. The assembly can be operated manually to open the oxygen mask box door for maintenance or inspection. The latch will swing, permitting the door to drop open. The assembly is mounted inside the service unit and is connected to the distribution manifold by flexible tubing. Each assembly has two or four outlet valves to which masks may be attached.

(1) On Original Interior Airplanes, the PSU is opened by removing a plug button on its side, introducing a pencil or similar tool through the uncovered hole, and pushing outboard a knob on the latch assembly.

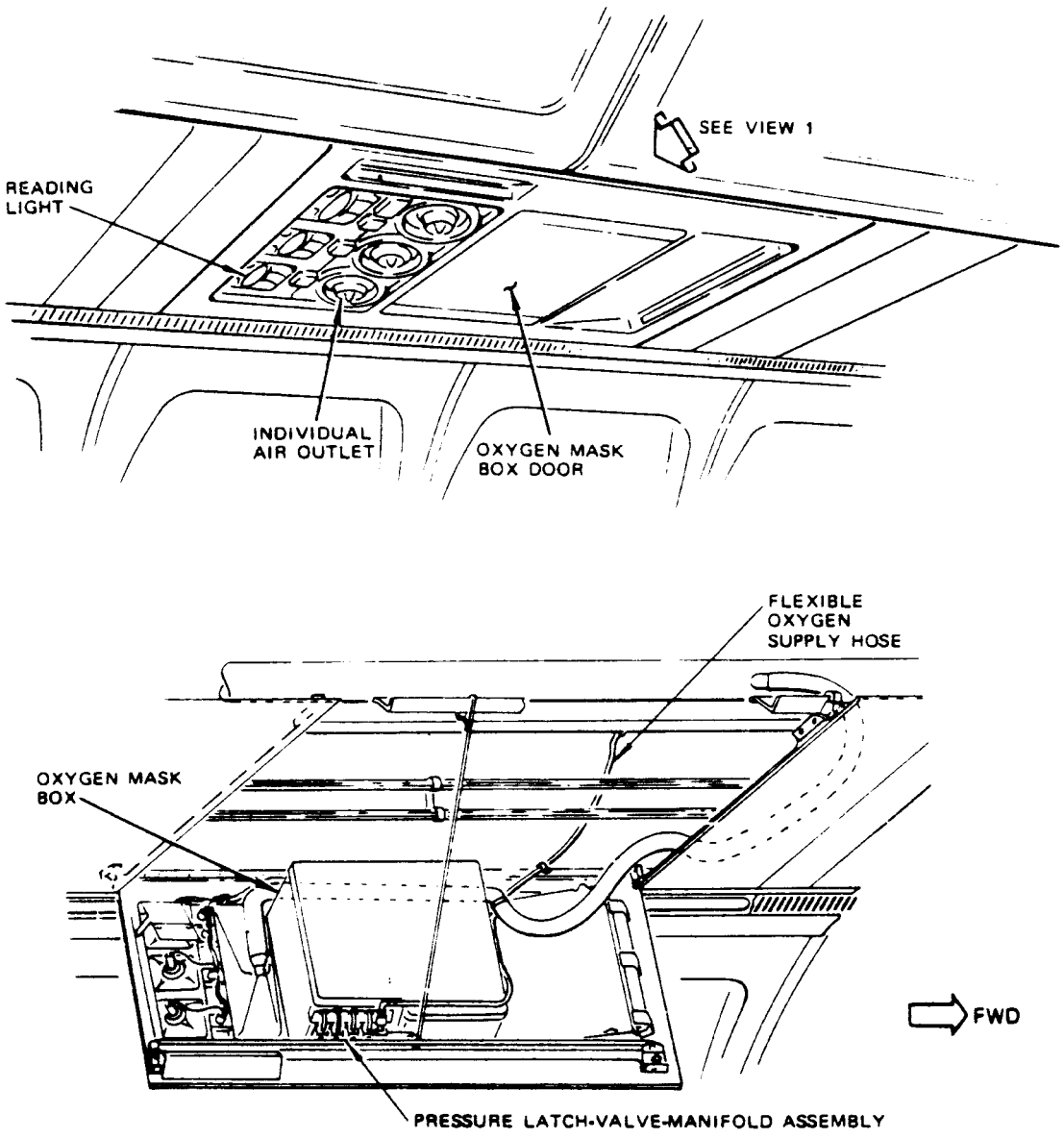
(2) On New Interior Airplanes, the PSU is opened by pushing in a pin through an access hole in the PSU door, using a 0.12-inch diameter pin punch or equivalent.



EFFECTIVITY

HATRACK TYPE INTERIOR

Passenger Service Unit
Figure 6 (Sheet 1)



VIEW 1

EFFECTIVITY

WIDE–BODY LOOK INTERIOR

Passenger Service Unit
Figure 6 (Sheet 2)

B. A spring maintains the latch plate in the closed position. The latch may be manually opened or automatically opened by oxygen pressure. for automatic operation, oxygen enters the assembly at the inlet port and forces a latch actuating plunger against the latch plate. The latch plate is thus moved to the open position. When pressure is relieved, the latch plate automatically returns.

C. Each oxygen mask is connected to its outlet valve by flexible tubing, and at a set distance along the tubing a valve actuating pin is attached by a short length of cord. The valve actuating pin is inserted into the outlet valve serving its mask, and maintains the valve in the closed position. Withdrawal of the pin will cause the outlet valve to open. The outlet valve may be closed either by reinsertion of the valve actuation pin or by means of a toggle type lever integral with the valve.
7. Executive Mask Boxes
. Executive mask boxes, containing either two or three masks, are mounted in the executive area and contain oxygen masks, door retention mechanism, and lanyard valves (Fig. 8 and 9).

7. Lavatory and Attendants' Service Unit Pressure Latch-Valve-Manifold Assembly

A. In the lavatory and attendants' service units the pressure latch-valve-manifold assembly is the same as that of the passenger service unit except for differences shown in figure 8. In order to operate the assembly manually, the pin must be pushed along a slot.

8. Passenger Oxygen Mask

A. The passenger oxygen mask assembly is an oronasal cup shaped continuous flow type unit and is connected to the outlet valve nozzle with flexible plastic tubing. A one liter reservoir bag is attached to the face piece with a check valve incorporated at the mask. The mask is designed to conform with facial contours and may be held to the head with the elastic head strap attached to it or also lends itself to simple one hand application.

9. External Servicing Panel (Airplanes so equipped)

A. External servicing is provided through the same external servicing panel used for the crew system. The pressure indicator is identical to that of the crew system and the filler valve is used in common for both systems.

10. Warning Devices

A. An amber PASS OXY ON light on the aft overhead panel indicates pressurization of the passenger oxygen system. A pressure switch, located downstream of the flow control valve in the electropneumatic continuous flow control unit, controls the light.

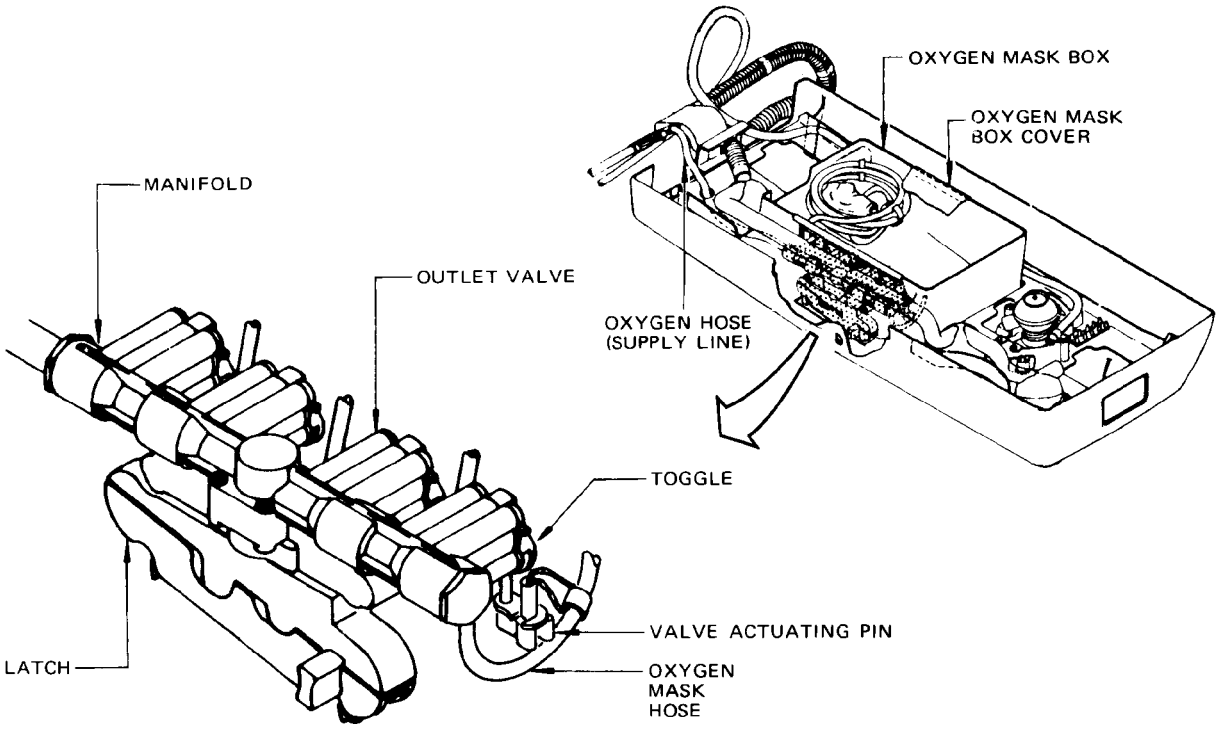
11. Passenger Oxygen System Shutoff Valve (Passenger/Cargo Convertible Airplanes)

A. The shutoff valve is a manually operated valve which is provided to interrupt oxygen flow to all passenger cabin service units except the forward lavatory and the forward attendant's service units (Fig. 2).

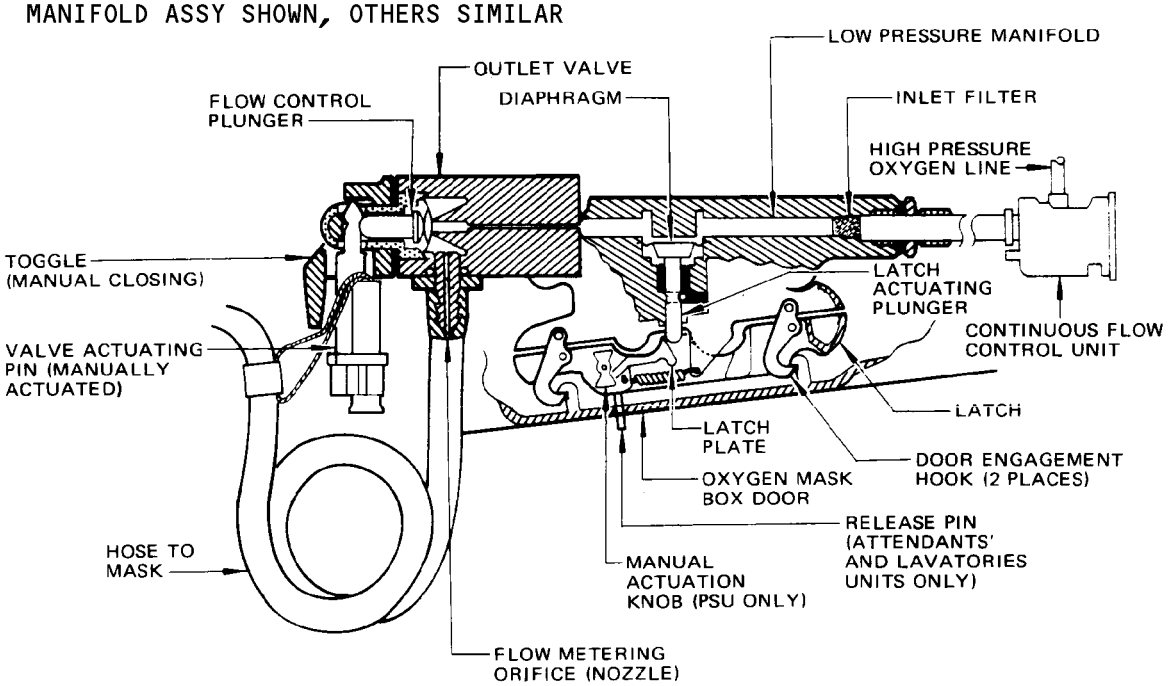
B. The valve is located behind an access door in the aft end of the forward lowered ceiling. When converting an airplane to all cargo use, push on access door to open, then rotate handle to fully closed position. In this position the handle will prevent the door from closing. When converting an airplane to passenger or passenger/cargo configuration, rotate handle to fully open position, then close access door (Fig. 9).

WARNING: WHEN CARRYING PASSENGERS THE VALVE MUST BE OPEN SO THAT OXYGEN IS AVAILABLE AT EACH PSU.

12. Thermal Compensators
    A. Thermal compensator assemblies are installed at several places in the system (Fig. 2). For a detailed description of thermal Compensators, refer to 35-09-100.
13. Operation
    A. The low pressure distribution system is pressurized automatically whenever cabin pressure drops to a pressure equivalent to an altitude of 14,000 feet or higher. On actuation, oxygen flows from the cylinder, through the continuous flow control units, to the service units. (See figure 2.) During the first few seconds, the flow control units release a pressure surge (50 to 100 psi) which causes the oxygen mask box doors to open. Each mask assembly then falls out and is suspended by the actuating attachment on the flexible tubing. The passenger must pull down the mask in order to apply it to his face for use. The action of pulling the mask down to a usable position withdraws the outlet valve actuation pin, allowing the valve to open and oxygen to flow to the mask.
    B. The system may be activated by operating the switch to open the solenoid actuation valve. The switch is located on the aft overhead panel and may be used in the event that both automatic valves fail to open during an emergency, or at the discretion of the flight crew. The manual actuation handle on the control cabin floor may also be used to pressurize the distribution lines.
    C. The user of the mask inhales pure oxygen until his reservoir bag is empty, then inhales air during the remainder of the inhalation cycle. The quantity of oxygen flow is controlled by the altitude-compensated continuous flow control units which regulate manifold pressure, and by a metering orifice (nozzle) in each mask outlet valve.



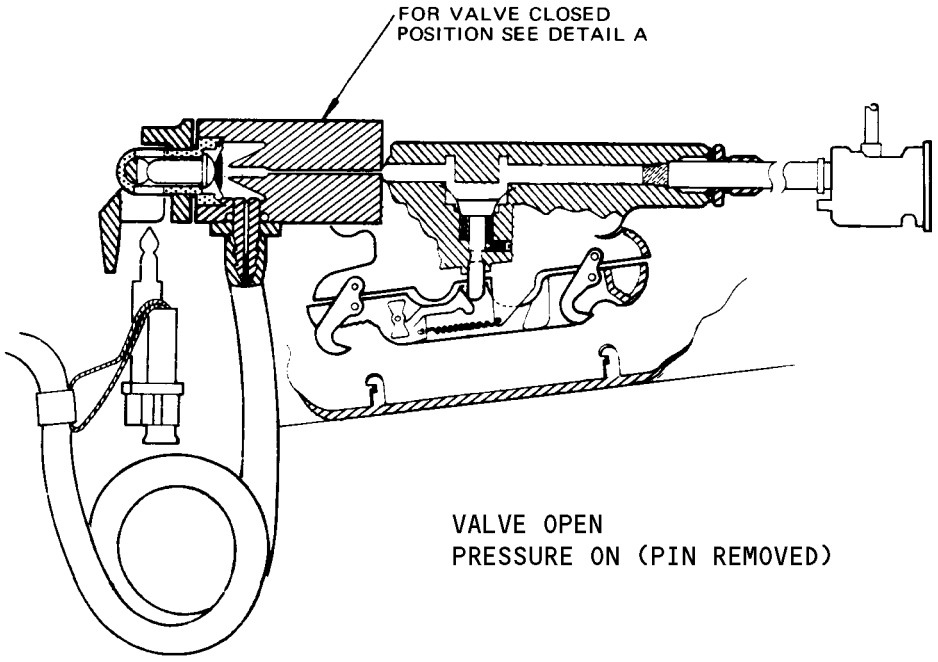
PASSENGER SERVICE UNIT LATCH-VALVE-MANIFOLD ASSY SHOWN, OTHERS SIMILAR

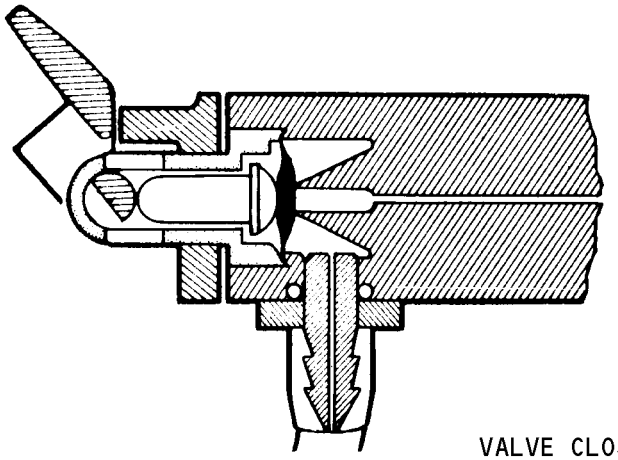


VALVE CLOSED, PRESSURE OFF

EFFECTIVITY
AIRPLANES WITHOUT NEW LOOK INTERIOR

Pressure Latch-Valve-Manifold Assembly Schematic
Figure 7 (Sheet 1)

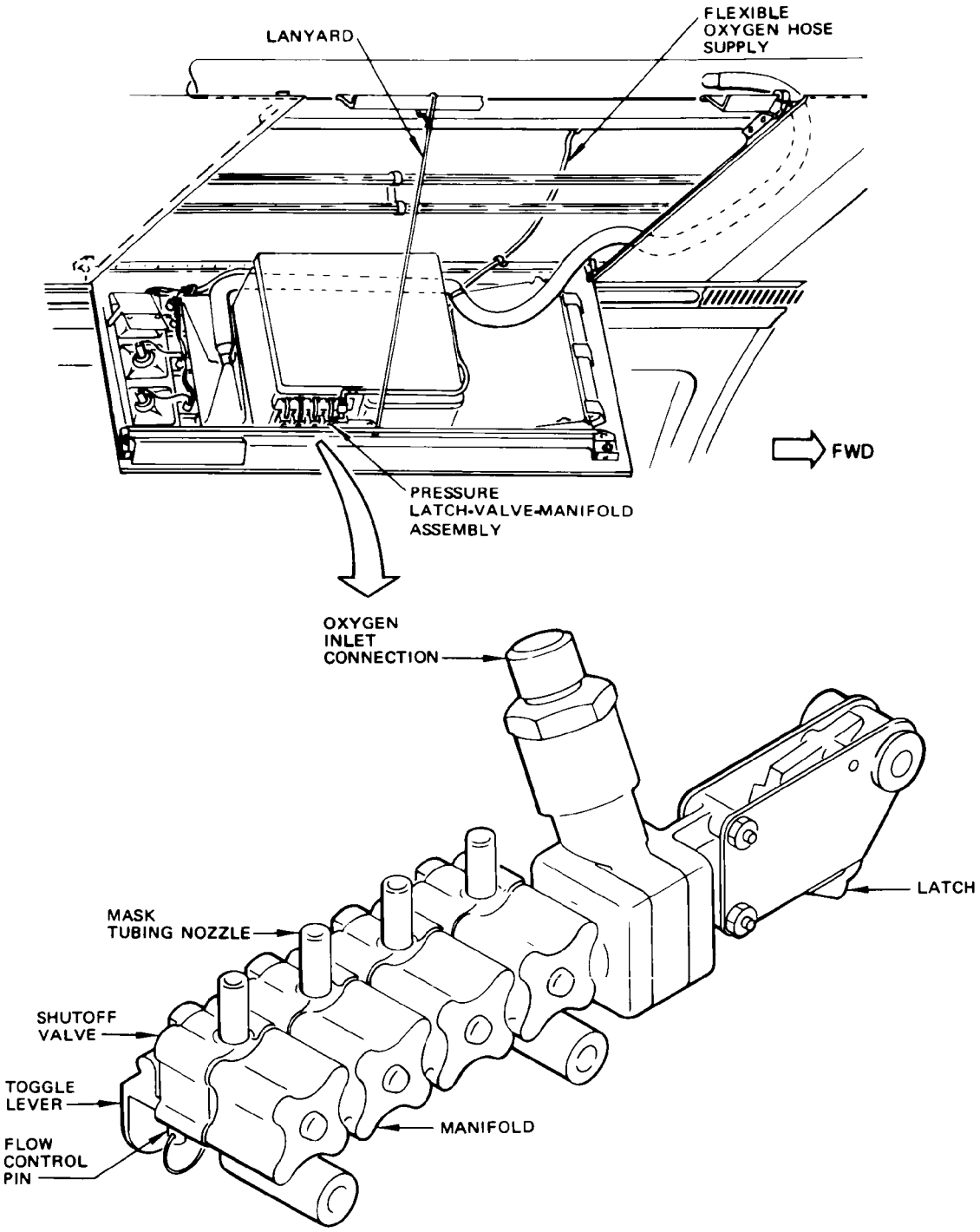




DETAIL A

EFFECTIVITY
AIRPLANES WITHOUT
NEW LOOK INTERIOR

Pressure Latch-Valve-Manifold Assembly Schematic
Figure 7 (Sheet 2)



PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY

EFFECTIVITY

New Look Interior Airplanes

Passenger Service Unit Pressure Latch-Valve-Manifold Assembly
Figure 8

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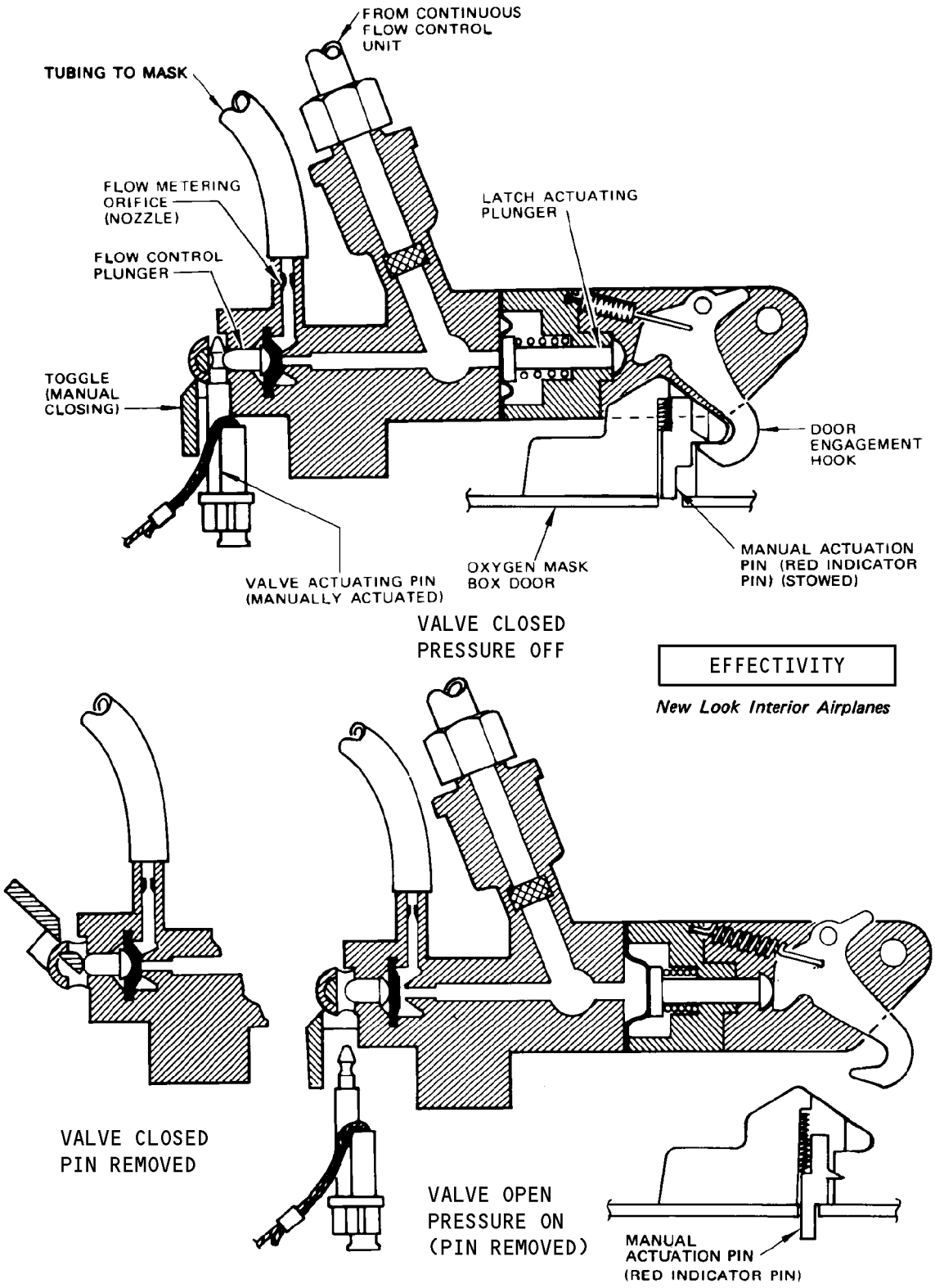
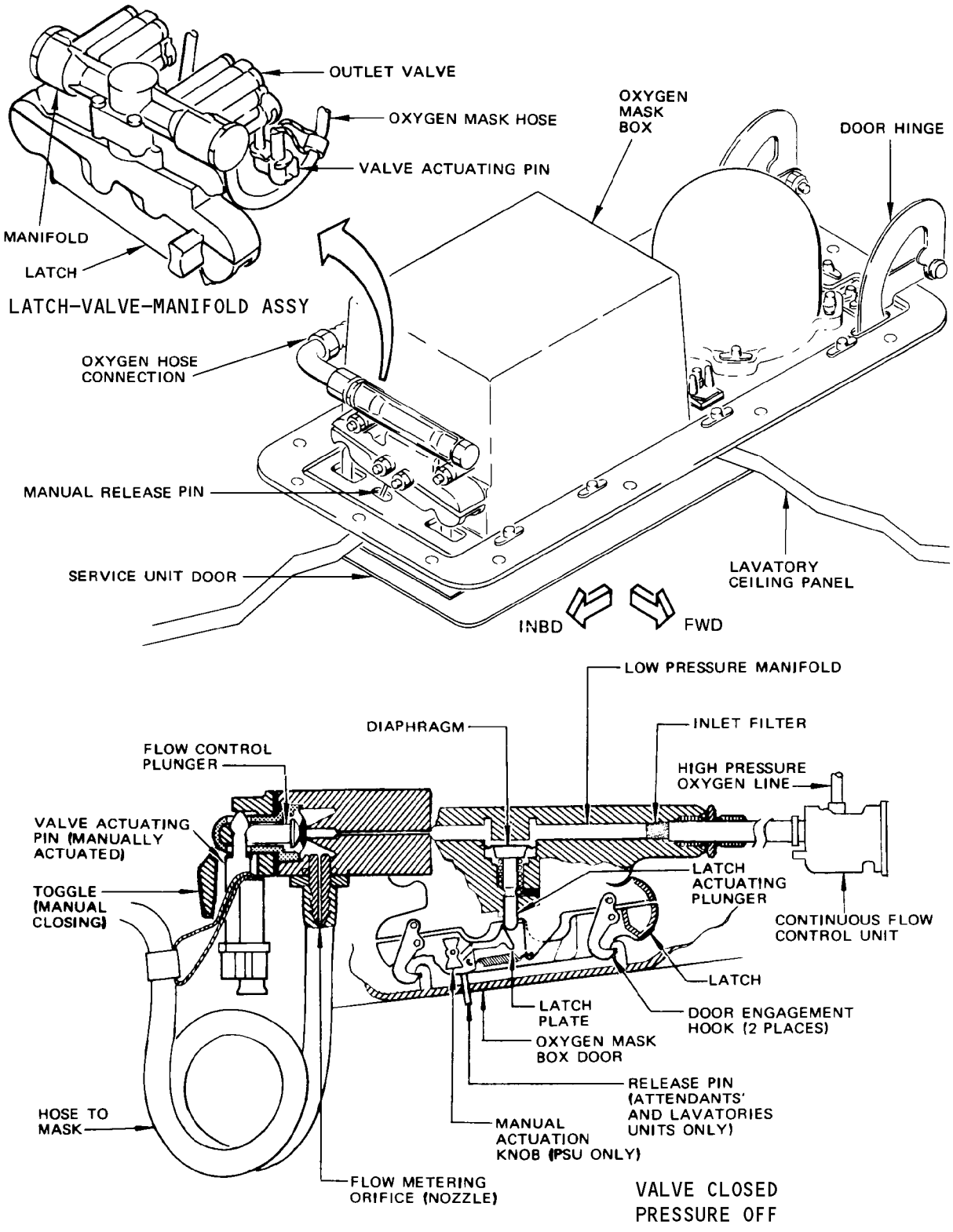


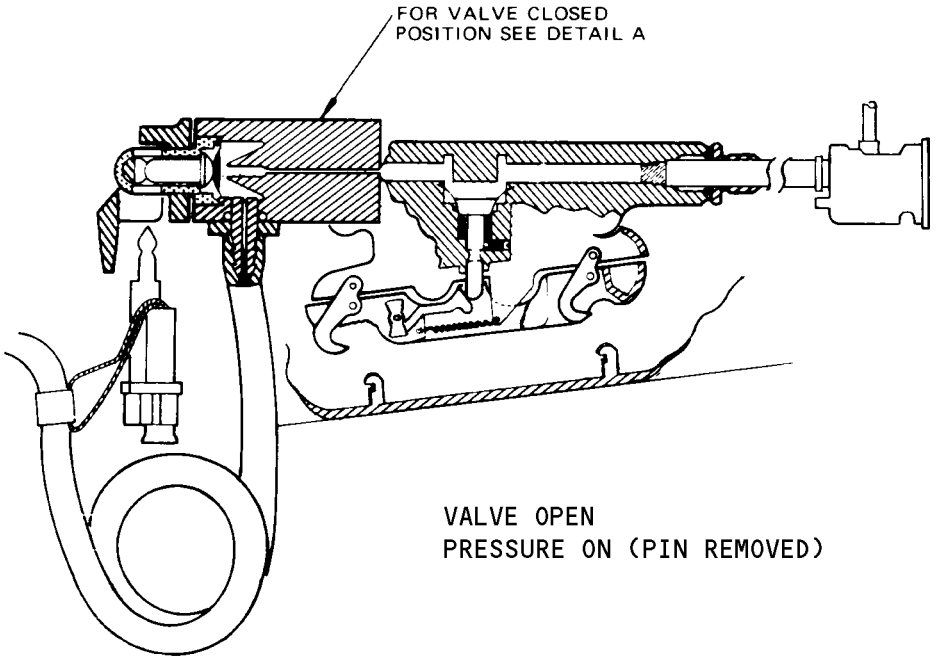
EFFECTIVITY

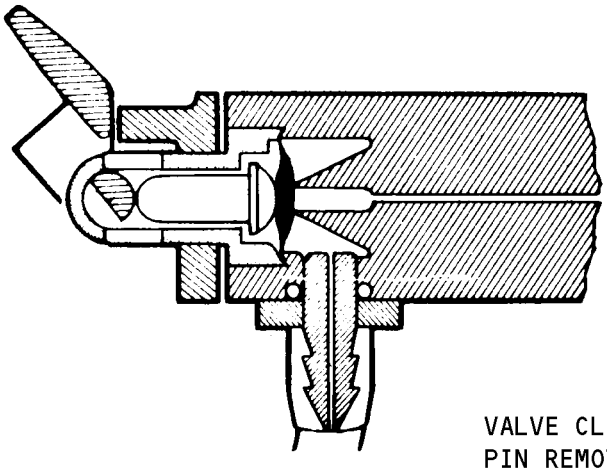
New Look Interior Airplanes

Passenger Service Unit Pressure Latch-Valve-Maniford Assembly
Figure 9



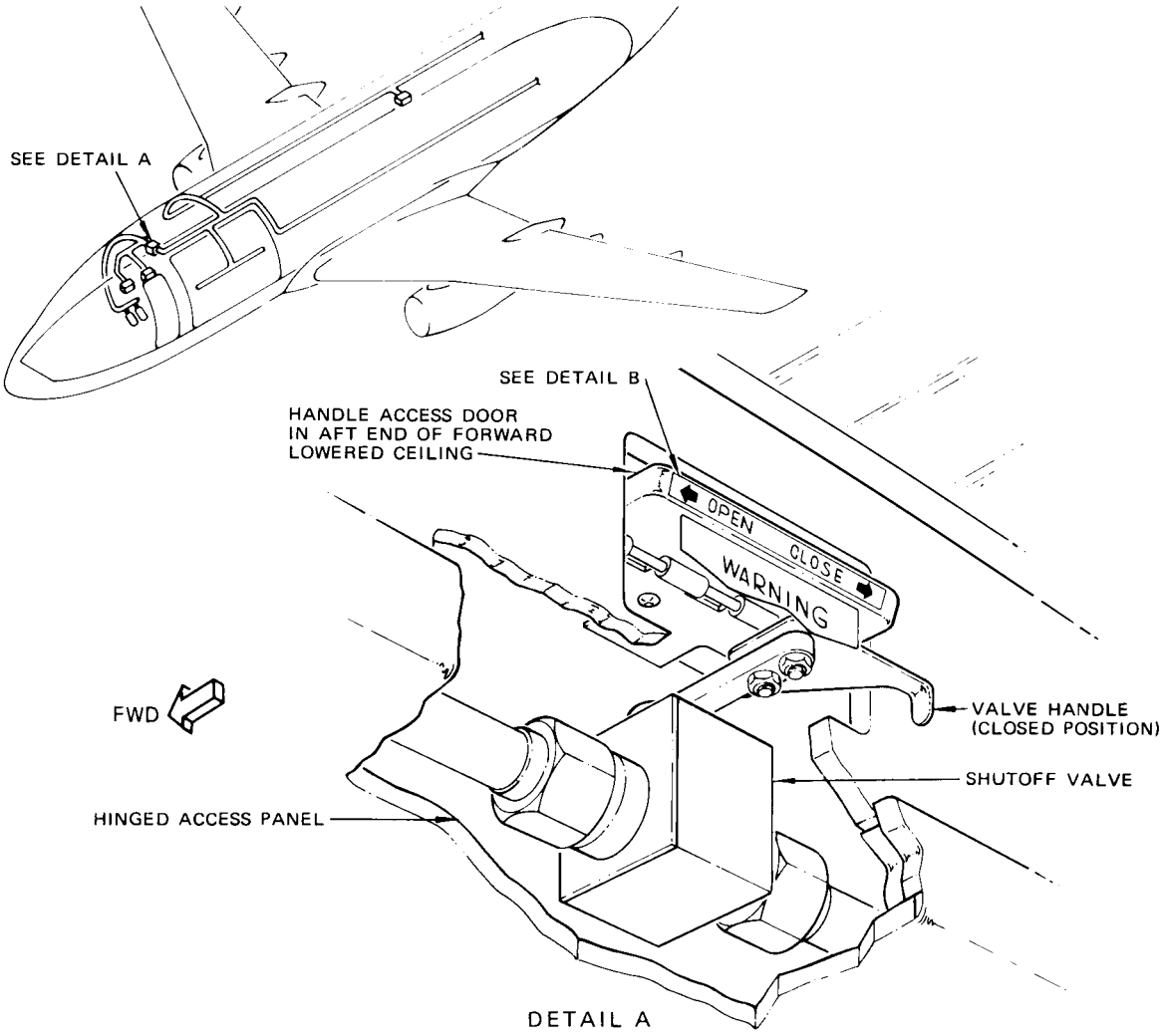
Lavatory and Attendant's Service Unit Pressure
Figure 10



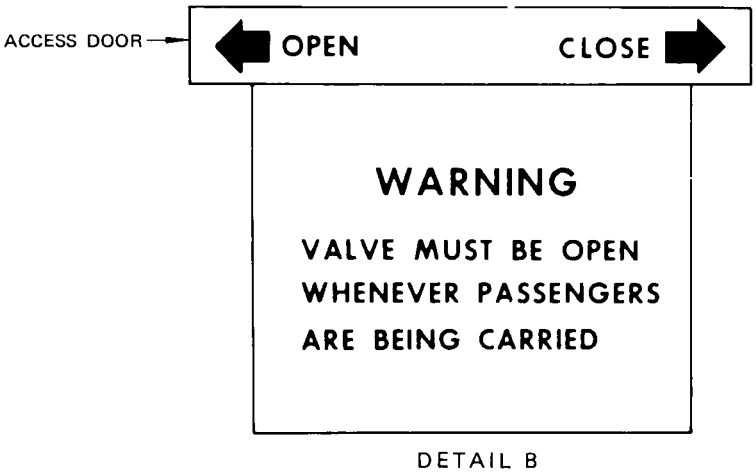


DETAIL A

Lavatory and Attendant's Service Unit Pressure 528
Figure 11



DETAIL A

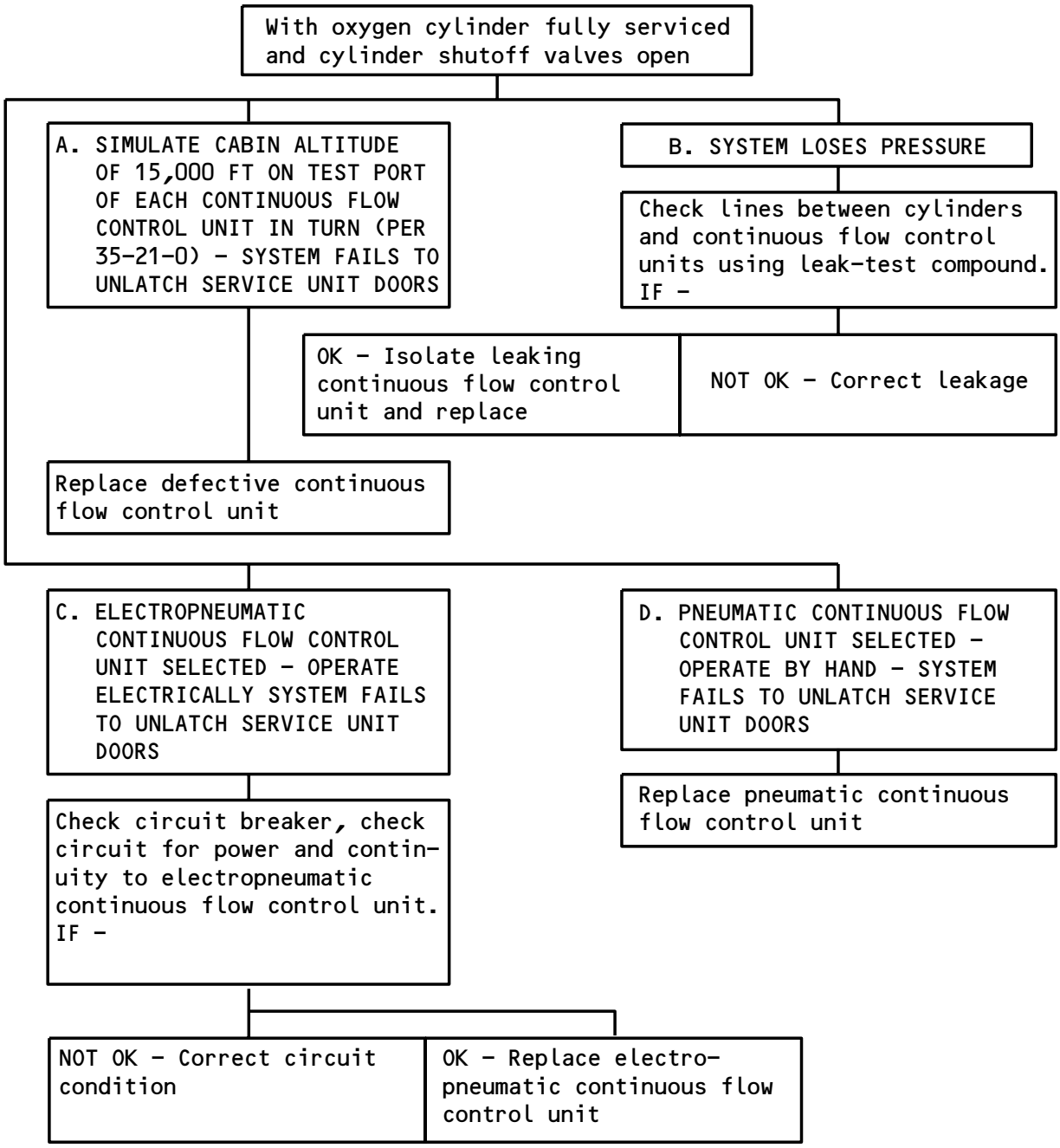


DETAIL B

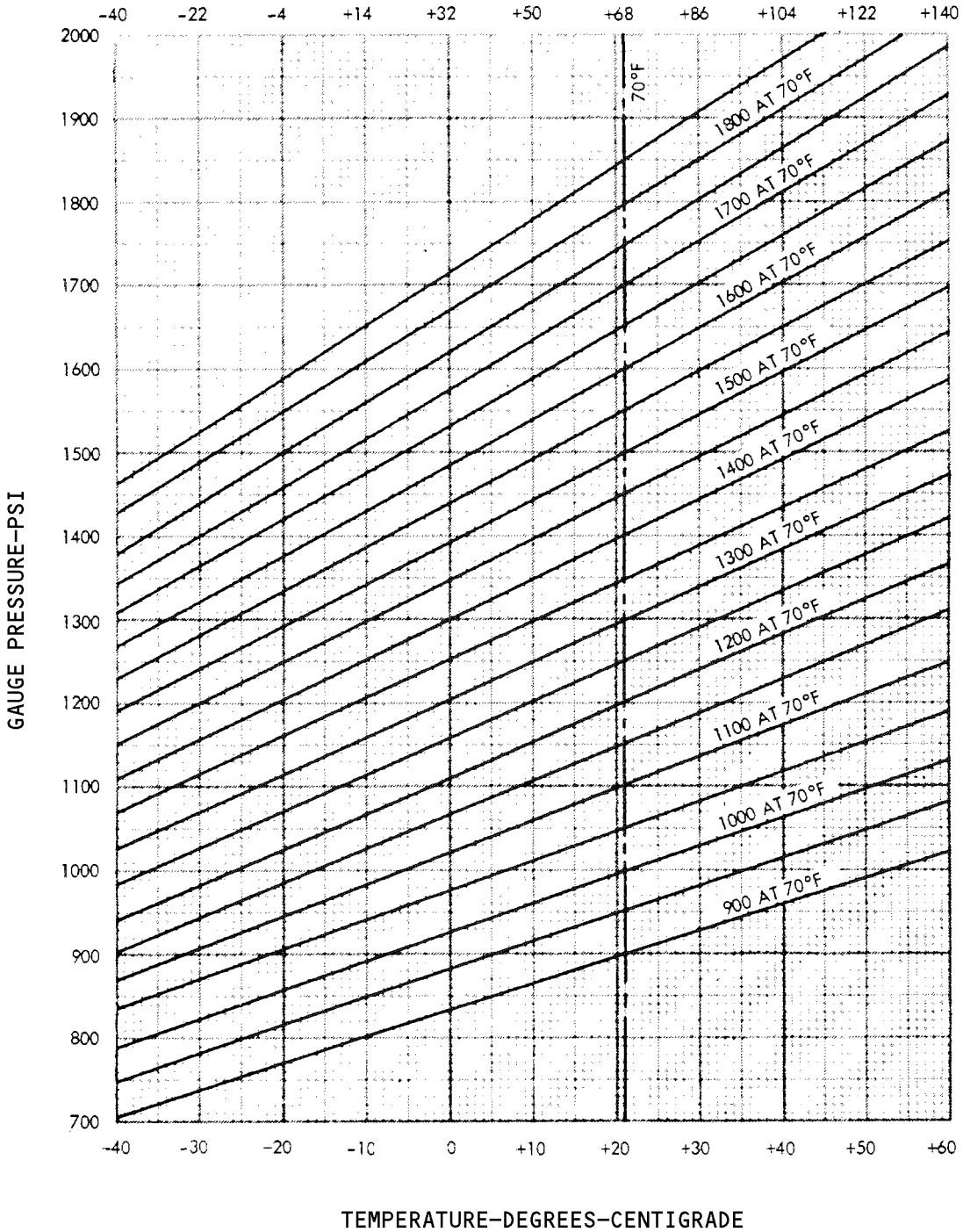
Passenger Oxygen System Shutoff Valve
Figure 12

PASSENGER OXYGEN SYSTEM - TROUBLE SHOOTING

1. General
   A. The passenger oxygen system is capable of holding pressure almost indefinitely, when not in use, with the cylinder shutoff valves open and the continuous flow control units not activated.
   B. Apparent loss of pressure may be caused by temperature change or leakage of the system. Oxygen cylinders are charged to 1850 psi at 70°F. See Fig. 102, Temperature Correction Chart, for variations.
   C. Since the system is normally inactive, operating troubles may be met only in the event that cabin altitude rises above a nominal 14,000 feet or during ground test under simulated altitude conditions.
   D. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound. Refer to Chapter 20, Miscellaneous Materials.
3. Trouble Shooting Chart
   A. Before using trouble chart for passenger/cargo convertible airplanes, make sure that passenger oxygen system shutoff valve is open.



Passenger Oxygen System Shutoff Valve
Figure 101



Passenger Oxygen Cylinder Pressure Temperature Correction
Figure 102

PASSENGER OXYGEN SYSTEM - MAINTENANCE PRACTICES

1. Return System to Normal After Mask Deployment
   A. General
      (1) The following is a procedure to return the passenger oxygen system to normal after deployment of all service unit masks.
   B. Return System to Normal
      (1) Reset continuous flow control units by pushing the handle in the control cabin to RESET, holding for 5 seconds, and returning to OFF.
         (a) Check that indicators on control units have moved away from ON.
         (b) If necessary, bleed low pressure system by opening 10 PSU oxygen shutoff valves.
            1) Observe that passenger oxygen pressure indication light on aft overhead panel goes off.
      (2) Repack masks as necessary (Refer to appropriate oxygen mask removal/installation procedure).
      (3) Service oxygen system (Ref Chapter 12, Oxygen Servicing).

PASSENGER OXYGEN SYSTEM - ADJUSTMENT/TEST

1. Passenger Oxygen System Test
   A. General
      (1) The passenger oxygen system tests consist of a high and a low pressure tubing leakage test and operation tests.
         (a) The high pressure leakage test is applied only to that portion of the passenger oxygen system upstream of the continuous flow control units. The low pressure test is applied to the passenger oxygen system downstream of the continuous flow control units. The high pressure leakage test may be either a simplified test using leak detection compound or a time/pressure decay leak test. The simplified test is limited to a check of reconnected or replaced line fittings which are accessible for viewing, either directly or with mirrors.
         (b) The high pressure time/pressure decay leak test procedures are different depending on whether the airplane has an external servicing panel and, if it does, whether it has servicing shutoff valves. Each possibility is covered in a different paragraph.
         (c) There are three operation tests according to the mode of actuation of the continuous flow control unit: automatic actuation, manual actuation, and electrical actuation. All three operation tests must be performed to test the operation of the system.
      (2) Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions (Ref 35-00, Maintenance Practices).
   B. Simplified High Pressure System Leakage Test

      NOTE: Refer to par. 1.A.(1)(a) for use limitations.

      (1) Equipment and Materials
         (a) Passenger Oxygen Cylinder, serviced to 1800 (±100) psi
         (b) Oxygen System Leak Detection Compound (Ref 20-30-51)
      (2) Perform Leak Test
         (a) Slowly open passenger oxygen cylinder shutoff valve.

            WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(b) Close cylinder shutoff valve immediately if audible or other indication of high leakage rate is evident.

WARNING: HIGH PRESSURE OXYGEN LEAKAGE MAY BE DANGEROUS TO PERSONNEL AND EQUIPMENT AND MUST BE AVOIDED.

(c) Apply leak detection compound, per section 35-00, Maintenance Practices, to all portions of fitting. There shall be no detectable leakage.

C. Time/Pressure Decay High Pressure System Leakage Test

(1) Equipment and Materials

(a) External pressure source (use one of the following):

1) Portable test cylinder filled with air or nitrogen at 2000 ±100 psi. Use nitrogen per MIL-P-27401; or air with no particles or fibers greater than 100 microns in the longest dimension per cubic foot of air, no more than 3 PPM total carbon by weight or 7 PPM total CH4 by volume, and with moisture content not exceeding 0.00002 grams per liter of air at 70°F and 760 MM mercury (equivalent to a dew point of -63.6°F at 760 MM mercury).

2) Portable test cylinder filled with oxygen at 2000 (±100) psi. (Oxygen per Specification MIL-O-27210, Type 1 is preferred. Deviation per S.A.E. (AS 1065) for moisture is allowed.)

(b) Pressure gage, 0 to 2000 psi with an accuracy of + 2% graduations not more than 100 psi apart, and a dial diameter of not less than 4 inches.

(c) Oxygen System Leak Detection Compound (Ref 20-30-51).

(2) Perform Leak Test (Airplanes having external servicing panel and servicing shutoff valves)

(a) Close passenger oxygen cylinder shutoff valve(s).

(b) Disconnect passenger oxygen cylinder(s) at connection between thermal compensator and high pressure line. Connect 0- to 2000-psi pressure gage to line connection . If more than one oxygen cylinder is used, cap remaining line end.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR(S) TO AVOID CONTAMINATION.

(c) Connect external pressure source to filler valve on external servicing panel. Set adjustment knob to 120°F. Open passenger oxygen external servicing shutoff valve and close crew oxygen external servicing shutoff valve.
(d) Check to see that manual control of continuous flow control unit is in OFF position.
(e) Slowly open external pressure source shutoff valve. Pressurize system to 1800 +100 psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(f) After system pressure has stabilized, close external pressure source shutoff valve.
(g) Observe test pressure gage over a 15 minute period. There shall be no observed pressure drop indication on gage.
(h) If pressure drops, check all connections as necessary using leak detection compound.
(i) Eliminate leaks and retest until satisfactory.
(j) Disconnect external pressure source, bleed high pressure line, and close passenger oxygen external servicing shutoff valve.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(k) Remove 0- to 2000-psi pressure gage. Remove oxygen cylinder thermal compensator protective cover and reconnect compensator to line.
(l) If additional passenger oxygen cylinder is used, uncap line, remove thermal compensator protective cover, and reconnect line to compensator.
(m) Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(n) Perform a simplified leak test of the oxygen cylinder thermal compensator connection(s) per paragraph B.

(3) Perform Leak Test (Airplanes with external servicing panel and without servicing shutoff valves)
(a) Close all passenger and crew oxygen cylinder shutoff valves.

(b) Disconnect passenger oxygen cylinder(s) at connection between thermal compensator and high pressure line. Connect 0- to 2000-psi pressure gage to line connection . If more than one oxygen cylinder is used, cap remaining line end.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR(S) TO AVOID CONTAMINATION.

(c) Slowly disconnect the crew oxygen system high pressure line at system check valve inlet. Observe residual pressure warning, step (b).
(d) Apply pressure-tight cap to the high pressure line open end and protective cover to the check valve inlet.

NOTE: Steps(c) and (d) may be omitted if it is desired to leak test both crew and passenger oxygen systems at the same time. For corresponding crew system test procedures, refer to 35-11-0, Flight Crew Oxygen System - Adjustment/Test.

(e) Connect external pressure source to filler valve on external servicing panel. Set adjustment knob to 120°F.
(f) Check to see that manual control of continuous flow control unit is in OFF position.
(g) Slowly open external pressure source shutoff valve. Pressurize system to 1800 (±100) psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(h) After system pressure has stabilized, close external pressure source shutoff valve.
(i) Observe test pressure gage over a 15-minute period. There shall be no observed pressure drop indication on gage.
(j) If pressure drops, check all connections as necessary using leak detection compound.
(k) Eliminate leaks and retest until satisfactory.

(l) Disconnect external pressure source and bleed high-pressure line.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(m) Slowly remove pressure cap applied in step (d). Observe residual pressure warning, step (l). Remove protective cover on check valve inlet and reconnect high-pressure line to check valve.
(n) Repeat steps (e) and (g). Check connection for leaks between crew oxygen system high-pressure line and check valve using leak detection compound per paragraph B.
(o) Close external pressure source shutoff valves and repeat step (l).
(p) Remove 0- to 2000-psi pressure gage. Remove oxygen cylinder thermal compensator protective cover and reconnect compensator to line.
(q) If additional passenger oxygen cylinder is used, uncap line, remove thermal compensator protective cover, and reconnect line to compensator.
(r) Slowly open all passenger and crew oxygen cylinder shutoff valves.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(s) Perform a simplified leak test of the oxygen cylinder thermal compensator connection(s) per paragraph B.

(4) Perform Leak Test (Airplanes without external servicing panel)
(a) Close passenger oxygen cylinder shutoff valve(s).
(b) Disconnect passenger oxygen cylinder(s) at connection between thermal compensator and high pressure line. Connect external pressure source and 0- to 2000-psi pressure gage to line connection. If more than one oxygen cylinder is used, cap remaining line end.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

CAUTION: COVER OPEN END OF THERMAL COMPENSATOR(S) TO AVOID CONTAMINATION.

(c) Check to see that manual control of continuous flow control unit is in OFF position.

(d) Slowly open external pressure source shutoff valve. Pressurize system to 1800 (±100) psi.

WARNING: SHUTOFF VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(e) After system pressure has stabilized, close external pressure source shutoff valve.
(f) Observe test pressure gage over a 15-minute period. There shall be no observed pressure drop indication on gage.
(g) If pressure drops, check all connections as necessary using leak detection compound.
(h) Eliminate leaks and retest until satisfactory.
(i) Disconnect external pressure source and 0- to 2000-psi pressure gage.

WARNING: RESIDUAL PRESSURE MAY EXIST IN LINES AND ESCAPE WITH SOME FORCE.

(j) Remove oxygen cylinder thermal compensator protective cover and reconnect compensator to line.
(k) If additional passenger oxygen cylinder is used, uncap line, remove thermal compensator protective cover, and reconnect line to compensator.
(l) Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(m) Perform a simplified leak test of the oxygen cylinder thermal compensator connection(s) per paragraph B.

D. Low Pressure System Leakage Test
(1) General
(a) A simplified low pressure system leakage test, using the passenger oxygen supply, can not be made as the pressure level downstream of the continuous flow control units is too low for satisfactory leak detection.
(2) Equipment and Materials
(a) External pressure source (Ref 1.C.(1)(a))
(b) Pressure reducer with constant 70-psi output pressure suitable for coupling to high pressure source as needed.
(c) Pressure gage, 0 to 80 psi
(d) Oxygen System Leak Detection Compound, Specification MIL-L-25567
(3) Prepare for Leak Test
(a) Close passenger oxygen cylinder shutoff valves.

(b) On Passenger/Cargo Convertible Airplanes, check that passenger oxygen shutoff valve is open.
(c) Disconnect outlet lines at continuous flow control units.
(d) Connect air or nitrogen supply coupled to 70-psi reducer to one disconnected line.
(e) Connect 0- to 80-psi gage to other disconnected line.
(f) Cap or plug unused lines or ports.
(g) Plug test/vent connections in aft lowered ceiling.

(4) Perform Leak Test
(a) Slowly apply regulated pressure from pressure source.

NOTE: Pressure latch on each service unit will operate between 17 and 30 psi and doors will open unless each door is retained by loosely fastening with masking tape or other appropriate means.

(b) Allow pressure to stabilize at 70 psi and close off pressure source. Maximum allowable pressure drop shall not exceed 10 psi over a 5 minute period.
(c) If pressure drop exceeds allowable limit, check all connections as necessary using leak-test compound.

(5) Restore Airplane to Normal Configuration
(a) Remove pressure source and pressure gage. Reconnect flow control units. Unplug test/vent connections.
(b) Close all service unit doors or remove fastening devices.
(c) Open oxygen cylinder shutoff valves.

E. Passenger Oxygen System Operation Tests
(1) General
(a) The passenger oxygen system operation may be tested using either an external pressure source or one of the cylinders in the system.
1) An external pressure source with a 0- to 2000-psi pressure gage should be used if the indication system is to be tested. To use this method, it will be necessary to apply external pressure to the oxygen cylinder manifold.

NOTE: The oxygen cylinder pressure gage indicates approximate quantity of oxygen in the system during handling transportation, etc., and is not suitable for testing the indication system because of possible reading error.

2) Oxygen system pressure may be used if the indication system is not to be tested. Proper procedure for either way of testing will be found at the step level.

(b) The external filler port cannot be used to pressurize the system for an operation test because the filler valve shuts off automatically once the preset pressure is reached, and no further servicing is allowed for 30 minutes. It is permissible to use this connection for a leakage test.

(2) Equipment and Materials

(a) External pressure source (use one of the following):

NOTE: Use cylinder pressure of 700 to 1900 psi. Passenger oxygen cylinder may be used as pressure source.

1) External pressure source (Refer to step 1.C.(1)(a))

(b) Vacuum source capable of maintaining 10 inches of Hg vacuum with minimum flow of 1 cfm

(c) Vacuum gage

(d) Pressure gage - 0 to 10 psi

(e) Pressure gage - 0 to 2000 psi with an accuracy of ±2%, graduations not more than 100 psi apart, and a diameter of not less than 4 inches

(f) Restraint assembly, P/N F70329

(3) Prepare for Test

(a) Provide electrical power.

(b) Check that OXY IND & VALVE circuit breaker on panel P18 is closed.

(c) Check that the following circuit breakers on panel P6 are closed:

1) All master caution circuit breakers
2) All master dim circuit breakers
3) Dim and test circuit breaker
4) All indicator lights circuit breakers

(d) Close all passenger oxygen cylinder shutoff valves.

(e) If external pressure source is to be used, proceed as follows:

1) Remove (one) passenger oxygen cylinder (Ref 12-15-21).
2) Connect pressure source and 0- to 2000-psi pressure gage to cylinder coupling.

(f) Ensure that continuous flow control units are reset by pushing manual control handle to RESET, holding for 5 seconds, and then moving to OFF. Close access door.

(g) Loosely fasten service unit doors to retain masks, using masking tape, restraint assembly, or other appropriate means, unless it is desired to drop and repack masks.

(h) On Passenger/Cargo Convertible Airplanes, check that passenger oxygen system shutoff valve is open.

(4) Test Passenger Oxygen System Operation with Automatic Actuation

(a) Connect vacuum source to test port on pneumatic continuous flow control unit. For location of control unit, refer to 35-21-21.

NOTE: Test port is labeled on unit.

(b) Slowly open external pressure source shutoff valve or one passenger oxygen cylinder shutoff valve.

WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(c) If indication system is being tested, check that passenger oxygen pressure indicators on aft overhead panel and on external servicing panel (on airplanes so equipped) read within + 100 psi of pressure source gage reading.

(d) Reduce pressure at test port on flow control unit to between 18.10 inches Hg absolute (13,250 feet) and 17.30 inches Hg absolute (14,400 feet).

(e) Observe that pressure latch on each passenger service unit operates and each door opens.

(f) Bleed system pressure:

1) Open two passenger service units.
2) Remove all oxygen masks from their outlet valves.
3) Open all outlet valves to bleed pressure.
4) Leave valves open.

(g) Connect 0-10 psi gage to one of the test/vent connections in aft lowered ceiling.

(h) Adjust vacuum pressure at test port on continuous flow control unit so that gage indicates 5.25 + 0.50/-0.00 psi.

(i) Select at random 10% of service units in passenger oxygen system, but not less than 6 units, whichever is greater.

1) Pull down on each oxygen mask in turn; with flow control pin removed, check for oxygen flow into each mask.
2) If any mask tested fails to have oxygen flow, perform test for all service units in system.

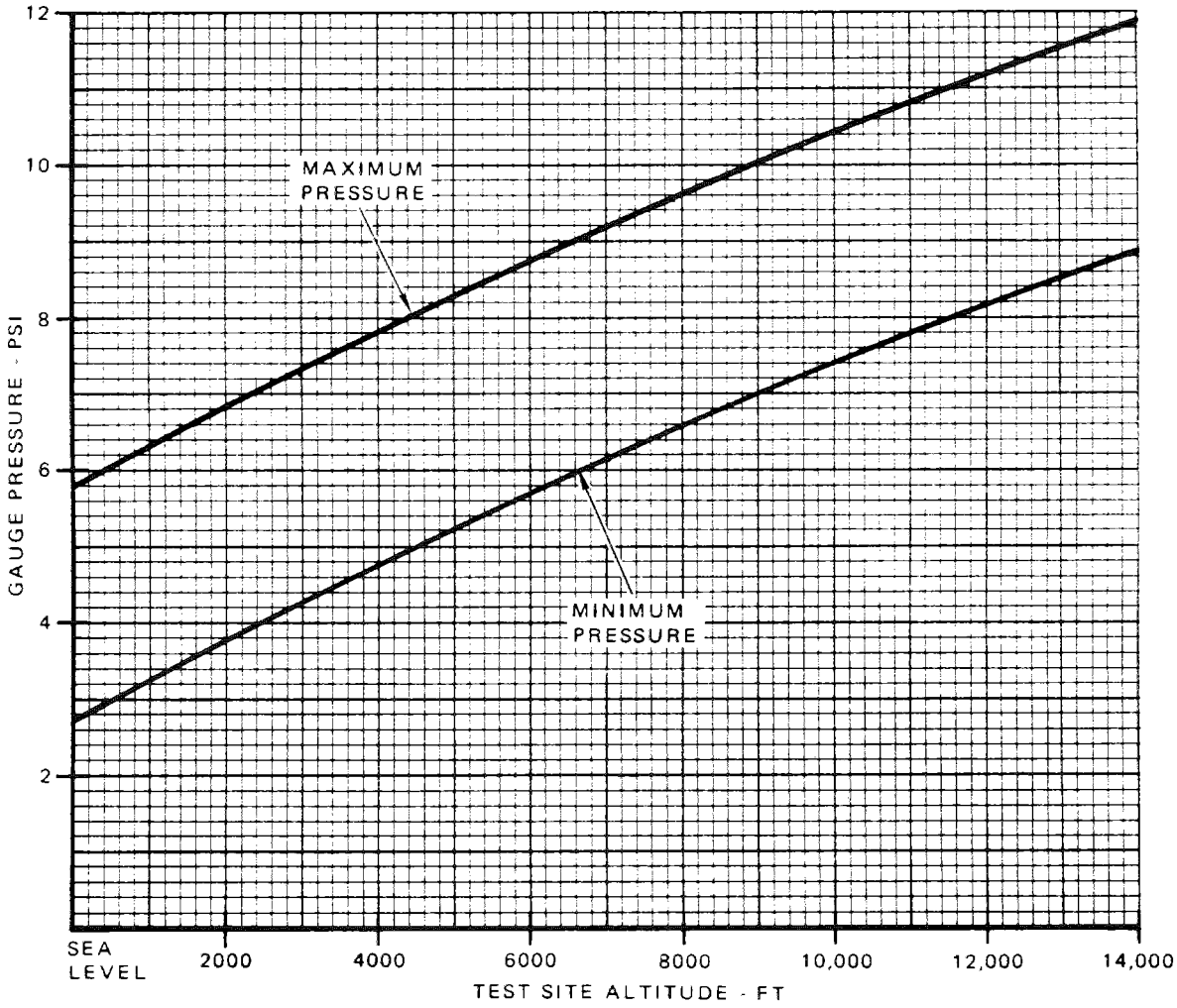
(j) Apply pressure at test port on continuous flow control unit of 13.76 inches Hg absolute (20,000 feet).

(k) Observe test pressure gage. Pressure in distribution line shall stabilize within pressures shown in Fig. 501 for test site altitude.

(l) Remove vacuum from continuous flow control unit.

(m) Close external pressure source shutoff valve or passenger oxygen cylinder shutoff valve.

(n) Reset continuous flow control unit(s) by pushing manual control handle to RESET, holding for 5 seconds, and then moving to OFF.



Pressure Limits When Simulating Altitude of 20,000 Feet
Figure 501

(o) Allow system pressure to bleed down to zero by observing test pressure gage. Close valves opened in step (f)(3).
(p) Disconnect 0-10 psi pressure gage from test/vent connection in aft lowered ceiling.
(q) Install flow control pins and repack masks as necessary (Ref 35-21, R/I). Close service unit doors.
(r) Connect vacuum source to test port on electropneumatic continuous flow control unit.
(s) Repeat steps (b) thru (g) and (j) thru (q).
(t) If no other operation tests are being performed, restore airplane to normal configuration.

NOTE: If another test is going to be performed next, masking tape or other device may be left installed as necessary.

(5) Test Passenger Oxygen System Operation with Manual Actuation
(a) Slowly open external pressure source shutoff valve or one passenger oxygen cylinder shutoff valve.

WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(b) Manually actuate system by pulling manual control handle to ON position.
(c) Observe that pressure latch on each passenger service unit operates and each door opens.
(d) Close external pressure source shutoff valve or passenger oxygen cylinder shutoff valve.
(e) Reset continuous flow control unit by pushing manual control handle to RESET, holding for 5 seconds, and then moving to OFF. Close access door.
(f) Bleed system pressure:
1) Open two passenger service units.
2) Remove all oxygen masks from their outlet valves.
3) Open all outlet valves to bleed pressure.
4) Close valves.
(g) Install flow control pins and repack masks as necessary (Ref 35-21, Oxygen Masks - Removal/Installation). Close service unit doors.
(h) If no other operation tests are being performed, restore airplane to normal configuration.

NOTE: If another test is going to be performed next, masking tape or other device may be left installed as necessary.

(6) Test Passenger Oxygen System Operation with Electrical Actuation
(a) Slowly open external pressure source shutoff valve or one passenger oxygen cylinder shutoff valve.

WARNING: VALVE MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(b) Turn on passenger oxygen system switch on aft overhead panel.
(c) Check warning circuits.
1) Observe that amber warning light adjacent to oxygen switch on aft overhead panel illuminates. At the same time, check that OVERHEAD annunciator light and master caution lights on pilot's lightshield illuminate.
2) Press one master caution light. Check that annunciator light and master caution lights go out while amber warning light remains on.
3) Press OVERHEAD annunciator light and check that it and master caution lights illuminate again.
4) Set master dim and test switch on overhead panel to dim. Check that lights dim.
(d) Observe that pressure latch on each passenger service unit operates and each door opens.
(e) Close external pressure source shutoff valve or passenger oxygen cylinder shutoff valve.
(f) Reset continuous flow control unit by pushing manual control handle to RESET, holding for 5 seconds, and then moving to OFF. Close access door.
(g) Bleed system pressure:
1) Open two passenger service units.
2) Remove all oxygen masks from their outlet valves.
3) Open all outlet valves to bleed pressure.
4) Close valves.
(h) Install flow control pins and repack masks as necessary (Ref 35-21, Oxygen Masks - Removal/Installation). Close service unit doors.
(i) Restore airplane to normal configuration per step (8).

NOTE: If another test is going to be performed next, masking tape or other device may be left installed as necessary.

(7) Test Passenger Oxygen System Shutoff Valve (Passenger /Cargo Convertible Airplanes)
(a) Move shutoff valve to fully closed position.

(b) Test oxygen system operation with manual actuation per above.

NOTE: Only forward lavatory and forward attendants' service units should open.

(c) Return shutoff valve to fully open position.

(8) Restore Airplane to Normal Configuration

(a) Remove external pressure source and install oxygen cylinder (Ref 12-15-21).

(b) Remove masking tape or other device from passenger service units.

(c) If passenger oxygen cylinder has been used, check cylinder pressure and refill if necessary (Ref 12-15-21).

PASSENGER OXYGEN CONTINUOUS FLOW CONTROL UNIT - REMOVAL/INSTALLATION

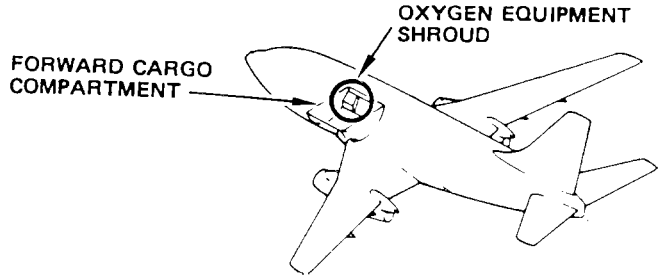
1. General
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00 MP.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref 20-30-51)
   B. Bonding meter (Ref 20-22-01)
3. Remove Continuous Flow Control Unit (Fig. 401)
   A. Close shutoff valve on passenger oxygen cylinder(s).
   B. Slowly disconnect inlet line B nut at upstream end of thermal compensator.

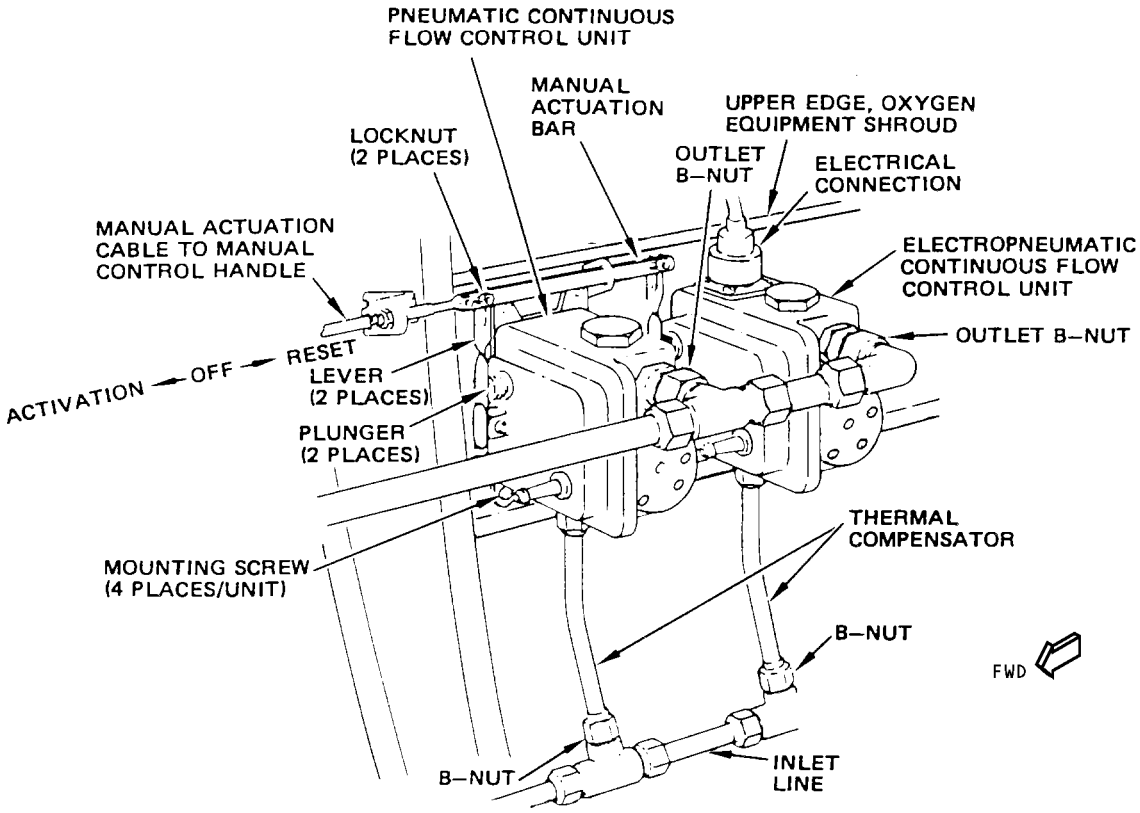
      WARNING: RESIDUAL PRESSURE IN HIGH PRESSURE LINE IS 1800 PSI AND OXYGEN WILL ESCAPE WITH SOME FORCE.

   C. Disconnect lever from manual actuation bar.
   D. Disconnect outlet line from unit.
   E. When removing electropneumatic unit:
      (1) Open OXYGEN IND & VALVE circuit breaker on P-18 panel.
      (2) Disconnect electrical connector from unit.
   F. Remove four unit mounting screws.
   G. Remove unit and thermal compensator attached together.
   H. Disconnect unit from thermal compensator (Ref 35-09-100 R/I).
   I. Cap open connections.
4. Install Continuous Flow Control Unit
   A. Ensure that shutoff valve is closed on passenger oxygen cylinder(s).
   B. Check that manual actuation handle is in OFF position.
   C. Attach control unit to thermal compensator (Ref 35-09-100 R/I).

      NOTE: If new control unit is being installed; remove and discard inlet fitting and O-ring, and install thermal compensator with BACP11K5 O-ring.

   D. Position unit, and loosely restore line connections.
   E. Loosely connect manual actuation bar nut to lever on unit.
   F. Mount unit.
      (1) Attach unit loosely to backing plate with screws.
      (2) Tighten the tube connections.
      (3) Tighten the screws.
   G. Adjust the lever on the unit to a point where physical contact with the reset plunger is eliminated. Then position lever to touch the face of the reset plunger without resulting in plunger displacement.
   H. Check that lever on the other unit is in the same position relative to its plunger.
   I. Tighten manual actuation bar nut.





Passenger Oxygen Continuous Flow Control Units
Figure 401

J. When installing electropneumatic unit.
   (1) Perform a bonding check (Ref 20-22-01) between the electropneumatic unit and airplane structure.

   NOTE: Resistance above 0.0225 ohm is not acceptable.

   (2) Connect electrical connector to unit.
   (3) Close OXYGEN IND & VALVE circuit breaker on P18 panel.

K. Check pneumatic unit for manual actuation.
   (1) Open floor access door.
   (2) Move manual control handle to ON position.
   (3) Check that indicator on unit has moved to ON.
   (4) Reset continuous flow control unit by pushing manual control handle to RESET, holding for 5 seconds, and then moving to OFF.
   (5) Check that indicator on unit has moved away from ON.
   (6) Close floor access door.

L. Check electropneumatic unit for electrical actuation.
   (1) Turn on passenger oxygen switch on aft overhead panel.
   (2) Check that indicator on unit has moved to ON.
   (3) Reset continuous flow control unit as follows:
      (a) Open floor access door.
      (b) Push manual control handle to RESET, hold for 5 seconds, and then move to OFF.
      (c) Close floor access door.

M. Slowly open shutoff valve on passenger oxygen cylinder(s).

   WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

N. Test high pressure line connection for leaks using oxygen system leak detection compound.

PASSENGER OXYGEN SERVICING SHUTOFF VALVE - REMOVAL/INSTALLATION

1. Remove or Install Passenger Oxygen Servicing Shutoff Valve
   A. Proceed the same as when removing or installing crew oxygen servicing shutoff valve. Refer to 35-11-51, Oxygen Servicing Shutoff Valve - Removal/Installation.

PASSENGER OXYGEN PRESSURE INDICATOR - REMOVAL/INSTALLATION

1. Remove or Install Passenger Oxygen Pressure Indicator
   A. Proceed the same as when removing or installing crew oxygen pressure indicator. Refer to 35-11-61.

PASSENGER SERVICE UNIT OXYGEN MASKS - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Plastic coil retainers.
2. Remove Masks
   A. Open oxygen mask stowage compartment door.
      (1) Remove blanking plug from aft face of unit by gripping with fingernails and pulling free. (See figure 401.)
      (2) Insert pencil or similar object through hole and engage knob on latch.
      (3) Pull latch inboard.

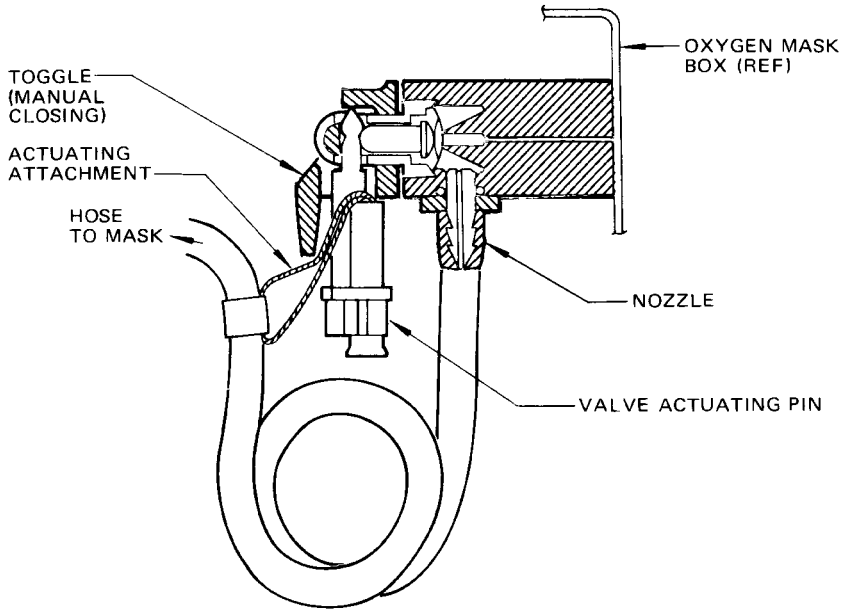
          NOTE: If difficulty is experienced latch may be released by inserting a piece of card or metal upwards about 2 inches into gap along aft edge of door and drawing it inboard until it trips latch plate.

      (4) Pull masks to free from strap.
   B. Disconnect mask from shutoff valve.
      (1) Pull hoses off nozzles.
      (2) Remove valve actuating pins from their actuating attachments.
      (3) Reinsert valve actuating pins into outlet valves.
3. Install Masks
   A. Prepare passenger service unit for mask installation:
      (1) Open call light lens and lower passenger service unit (Ref Chapter 25, Passenger Service Unit - R/I).
      (2) Remove plastic cover from oxygen mask stowage compartment.
      (3) Open service unit door by manually triggering door latch.

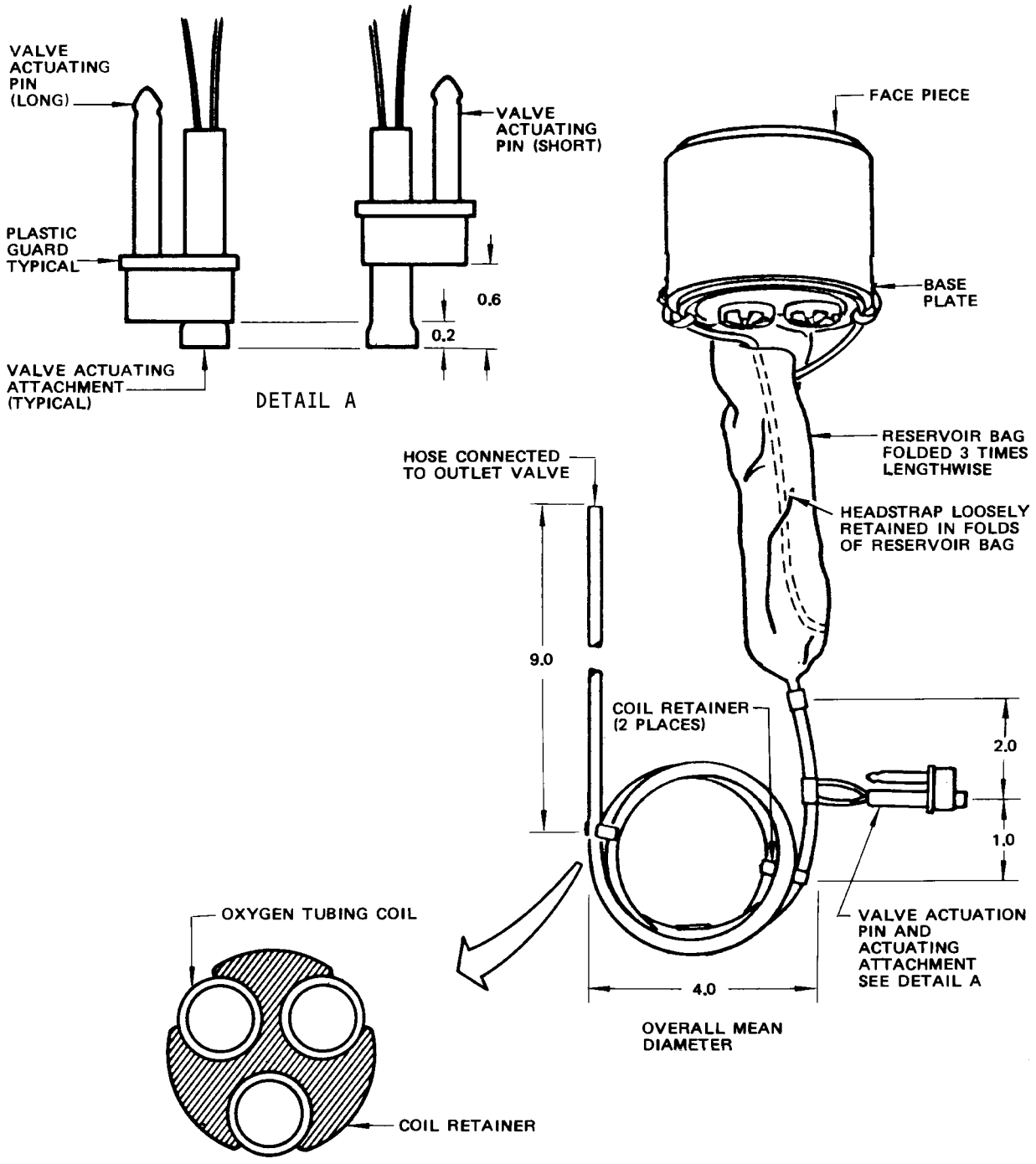
          NOTE: Allow mask carrier to drop out.

      (4) Check that hinges allow door to open freely.
      (5) Check that mask carrier is attached to door by retaining strings with concave side of carrier facing forward (Fig. 403).
   B. Prepare masks per Fig. 402.

      NOTE: Prior to installing oxygen masks, check that mask hoses (tubing) is soft and supple. Discoloration of the mask hoses occurs with the passage of time and is not cause for removal of the mask assembly. Replace mask assembly as required.



Valve Actuating Pin Installation
Figure 401



Passenger Service Unit Mask - Preparation for Installation
Figure 402

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C. Keeping the tubing against the stowage compartment aft wall, connect tubing to each valve by pressing fully onto valve outlet. (See figure 402.)
D. Keeping the tubing against the stowage compartment aft wall, connect tubing to each valve by pressing fully onto valve outlet (Fig.401).

NOTE: This step may be made easier by reaching up through stowage compartment.

NOTE: Valve end of tubing must be against compartment aft wall and mask actuating attachment must be on outboard side of its pin.

E. Install a strap assembly to top of mask stowage compartment (Fig. 404).
F. Place coils on strap assembly (Fig. 405).

NOTE: Make sure that coils are evenly distributed on strap assembly.

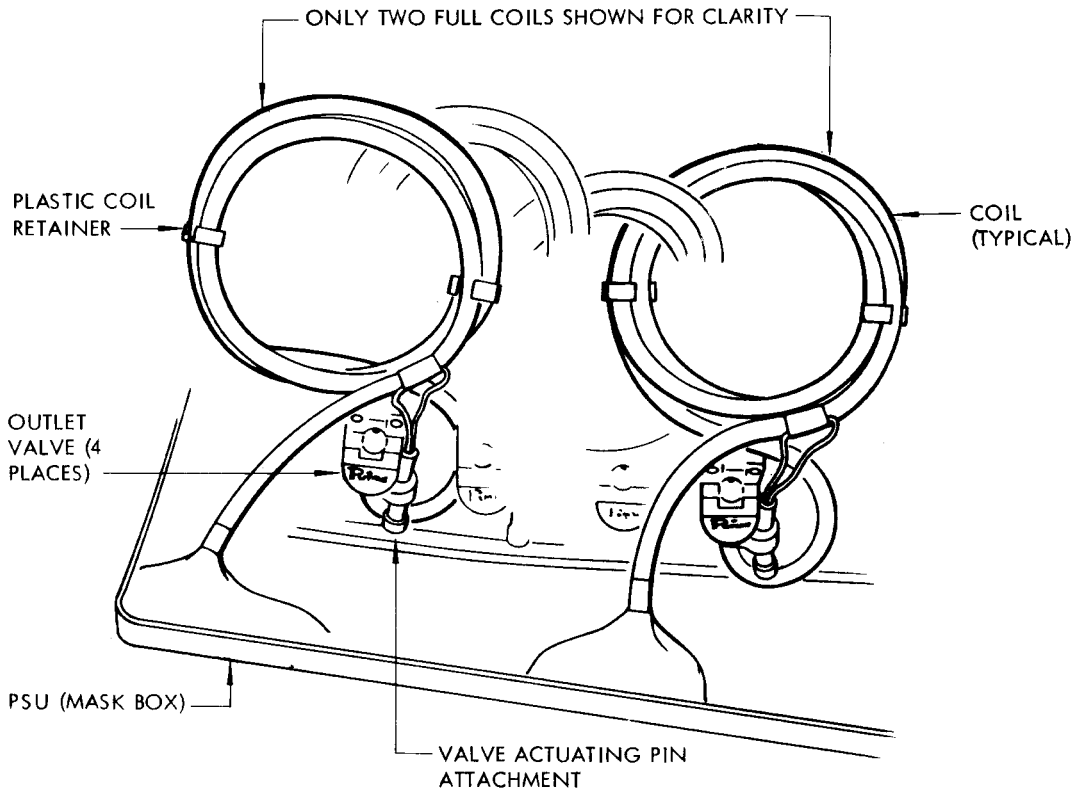
G. Install cover on mask stowage compartment and secure with velcro tape.
H. Raise and latch passenger service unit and install call light lens. Refer to Chapter 25, Passenger Service Unit - Removal/Installation.
I. Install facepieces.
(1) Rotate mask carrier until concave side faces upward.
(2) Place facepieces in carrier with open end of outboard mask facing inboard and other masks facing outboard (Fig. 406).

NOTE: The end of the tubing contained in the reservoir bag must be positioned to the aft side of the carrier.

(3) Insert carrier with facepieces into stowage compartment and slowly close PSU door, keeping carrier as close as possible to forward wall of compartment (Fig. 407).

NOTE: Check that no part of any mask assembly is caught between the edges of the carrier and the compartment sidewall.

(4) Close and latch PSU door.



Coil Positioning
Figure 403

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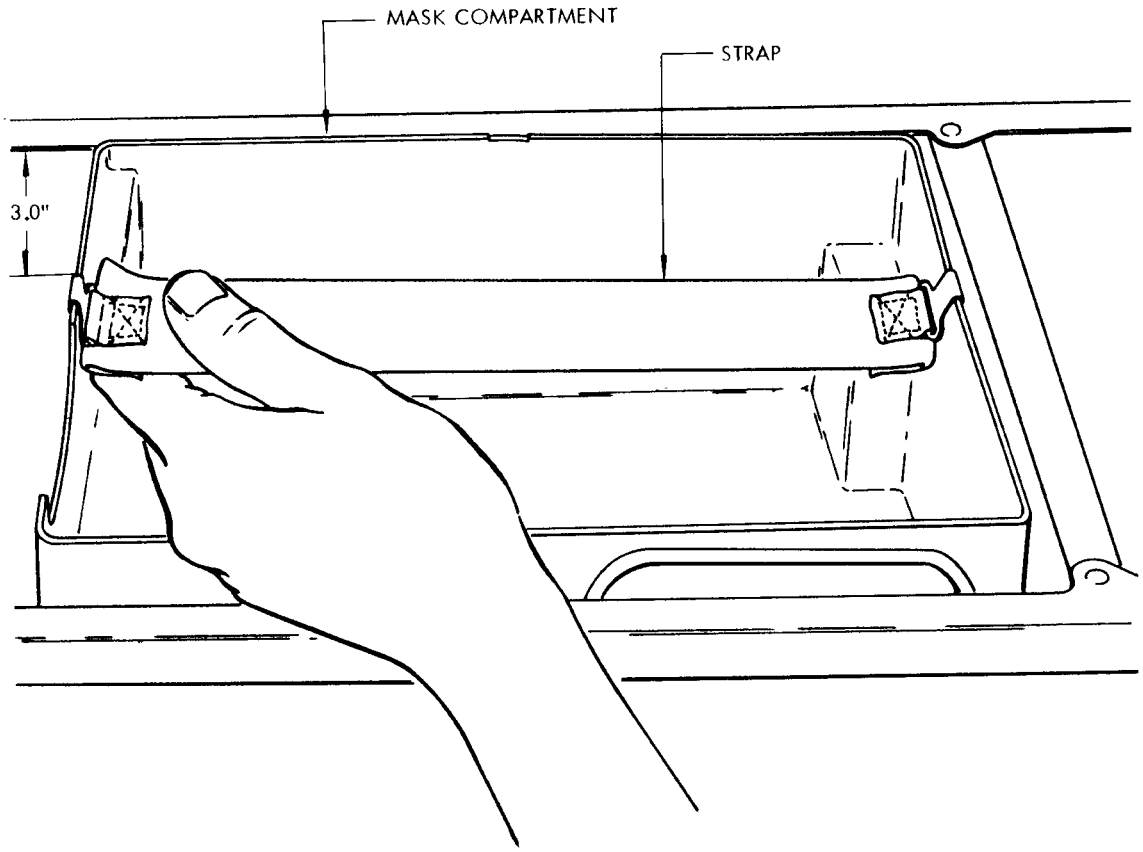
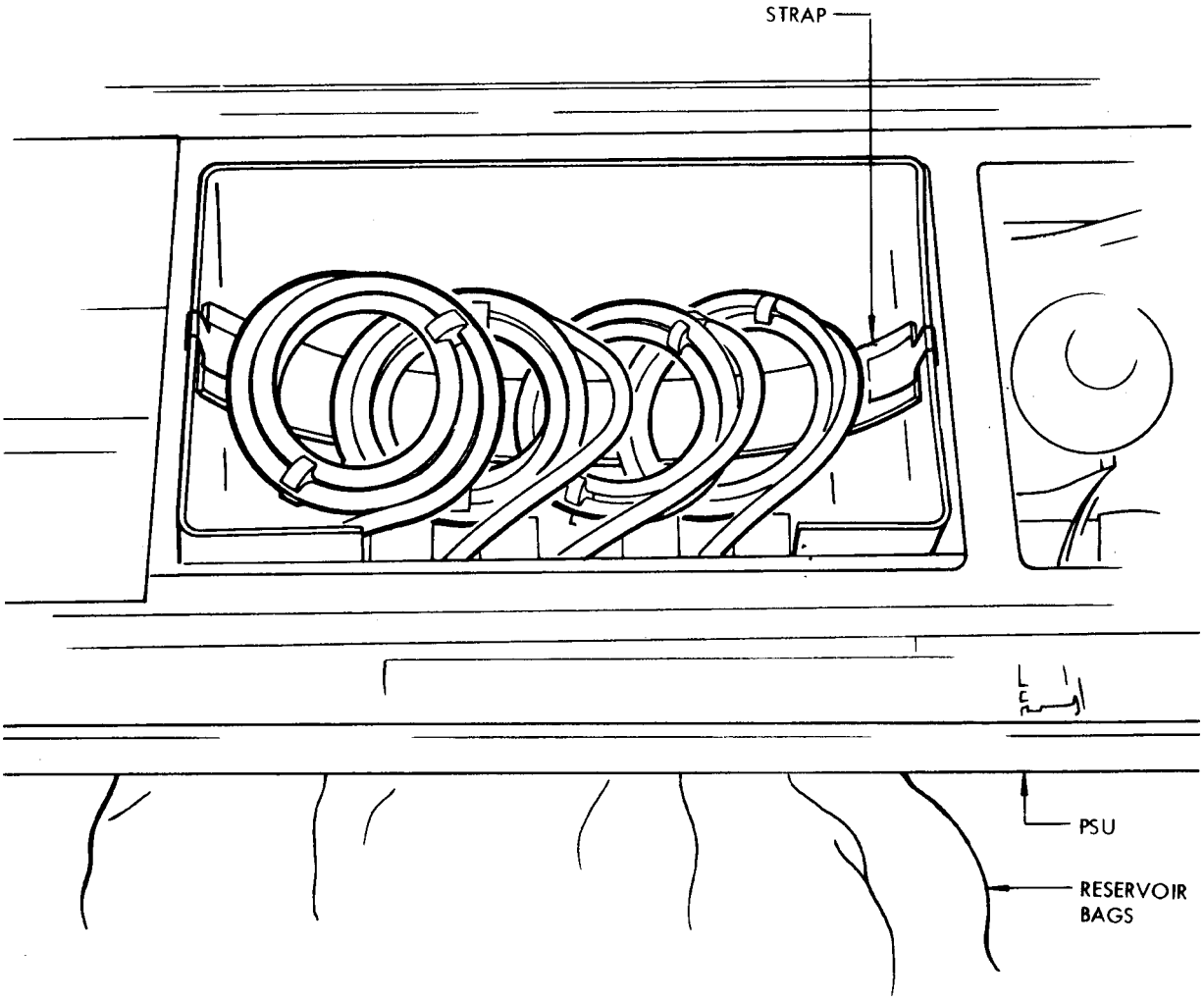
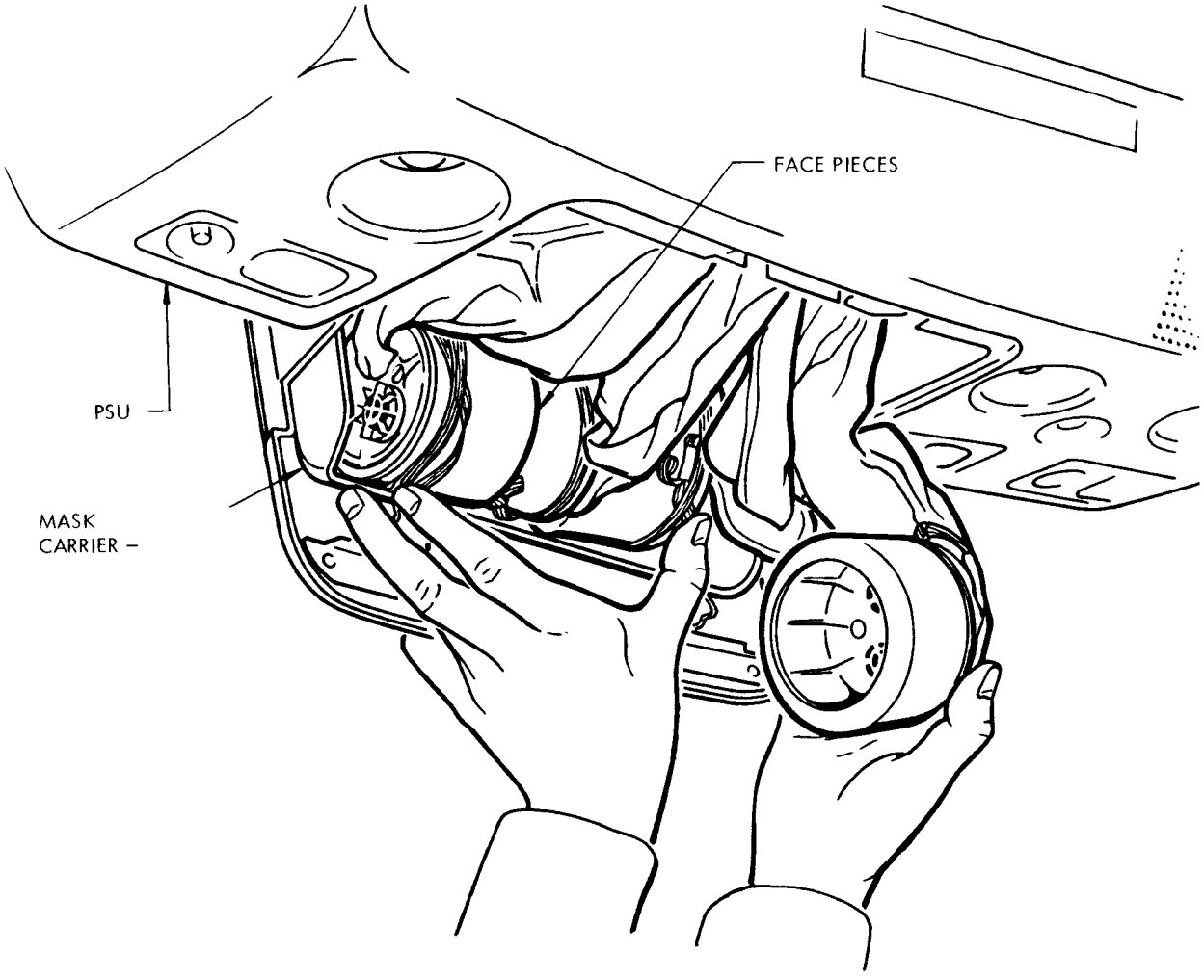


Strap Installation
Figure 404

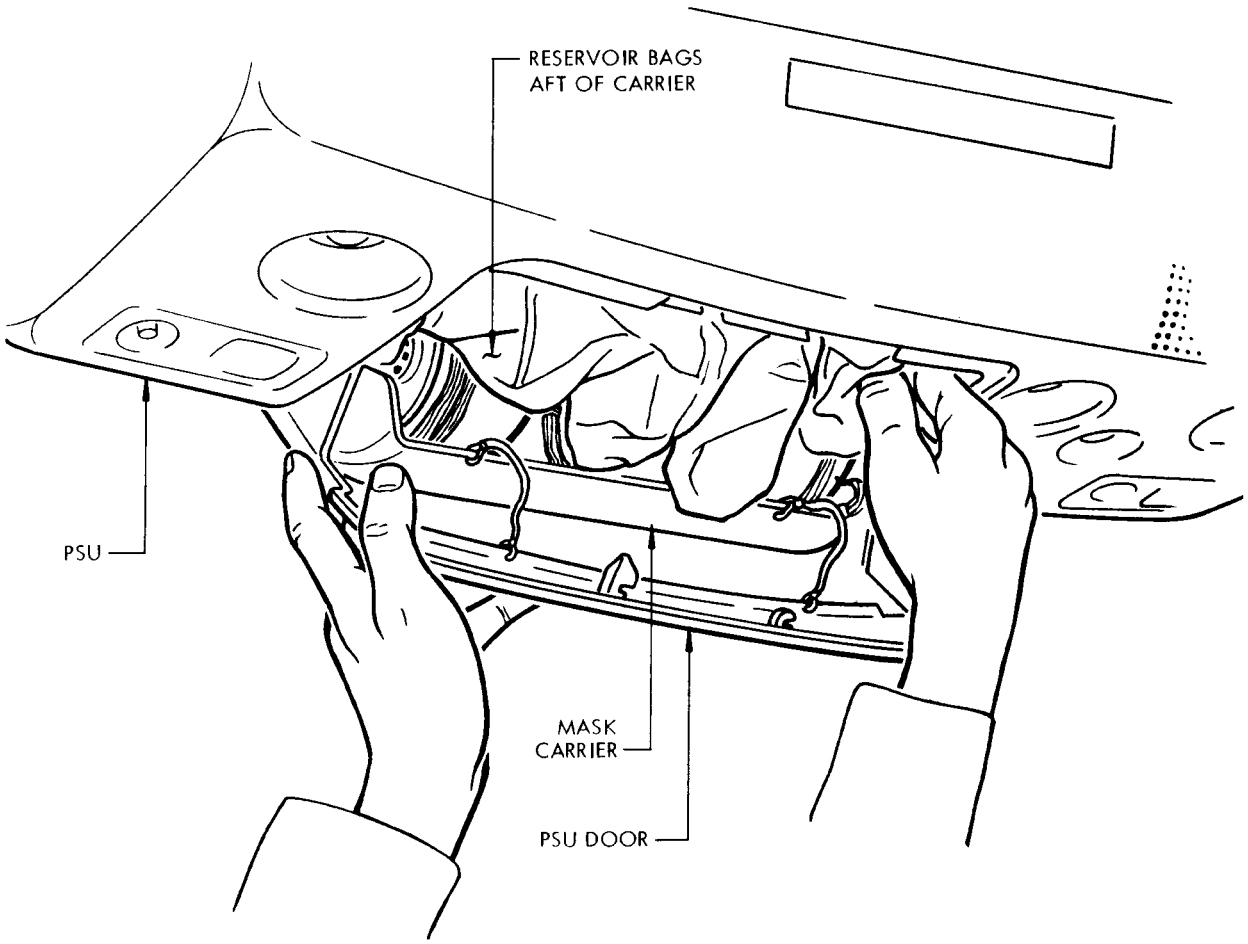


Coil Installation
Figure 405

466642



Installation of Facepieces
Figure 406



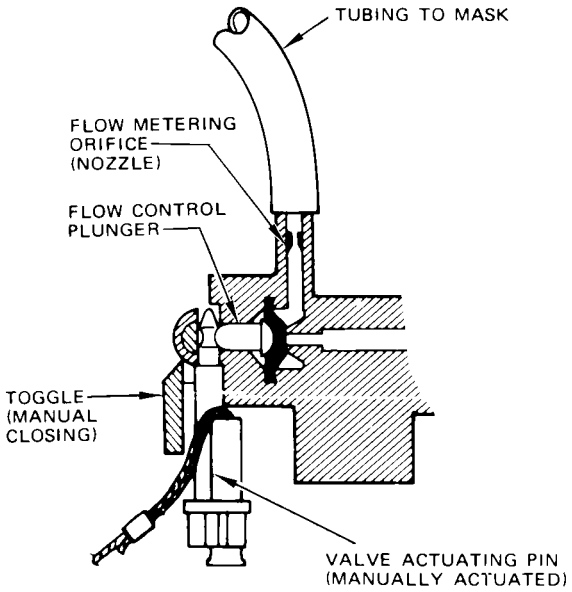
Closing PSU Door
Figure 407

PASSENGER SERVICE UNIT OXYGEN MASKS - REMOVAL/INSTALLATION

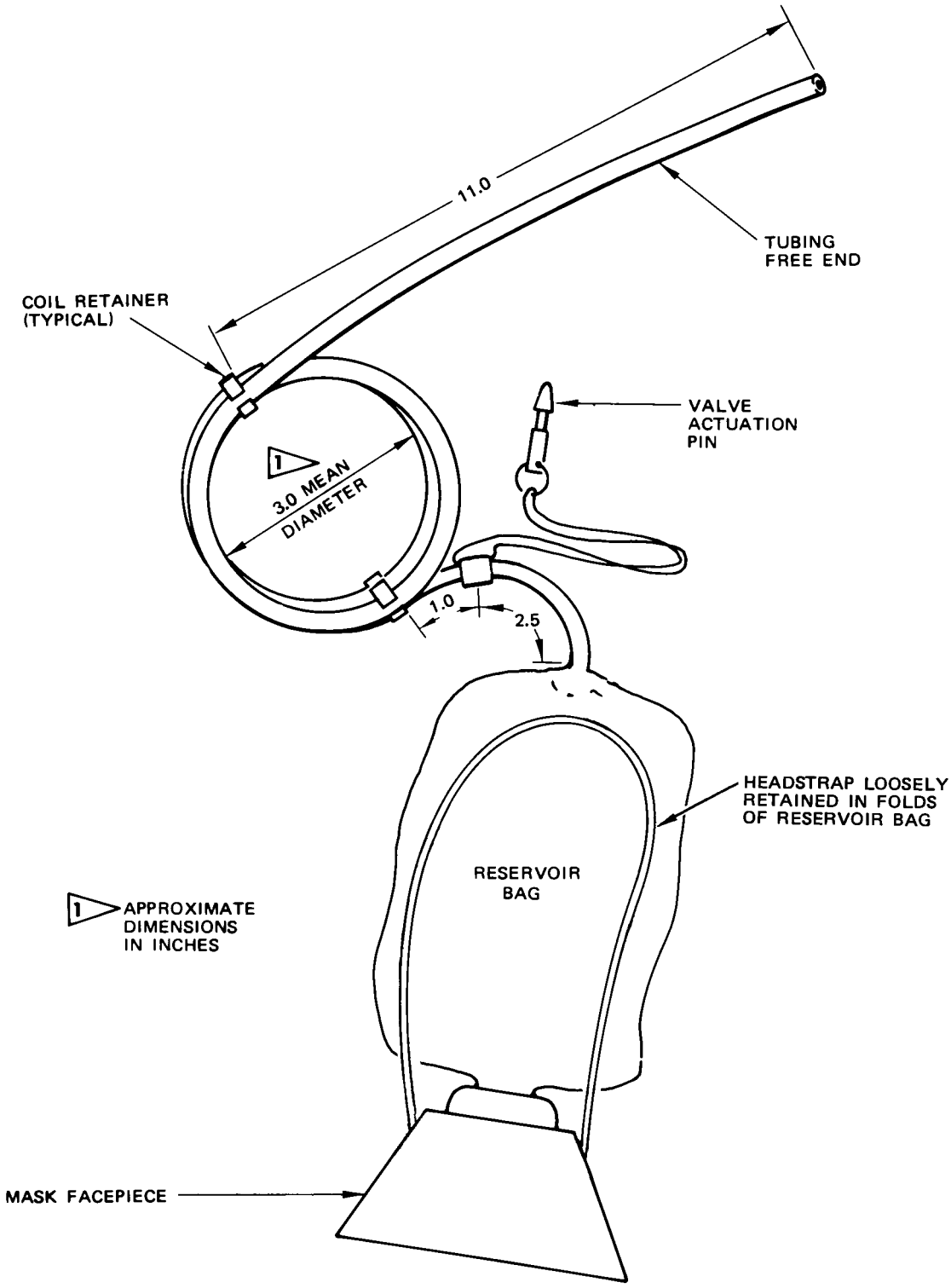
1. Equipment and Materials
   A. Plastic coil retainers
   B. Tube Guide - 69-62463-1, or equivalent
   C. Vinyl tape - white, 0.75 to 1.00 inch wide, Johnson & Johnson Inc., Permacel Division (V99742), U. S. Highway 1, New Brunswick, N. J. 08903
   D. Plastic Straps - MS17821-1-9, or equivalent
   E. Plastic Strap Installation Tool - MS17823-2, or equivalent
   F. Pin punch - 0.12-inch diameter, or equivalent
2. Remove Masks
   A. Using pin punch, push in pin recessed into hole in PSU door, to open latch and allow masks to drop.
   B. Lower PSU. Refer to Chapter 25, PSU - Maintenance Practices.
   C. Remove tape and remove oxygen mask box cover.
   D. Push mask tubes up through tube guide to form large loops above tube guide.
   E. Cut and remove plastic straps holding tubes to valve nozzles.
   F. Pull valve actuating pins out of engagement with outlet valves. (See figure 401.)
   G. Pull hoses off nozzles.
   H. Remove tube guide.
   I. Remove valve actuating pins from actuating attachments.
   J. Reinsert valve actuating pins into outlet valves.
3. Install Masks
   A. Prepare masks per Fig. 402.

      NOTE: Prior to installing oxygen masks, check that mask hoses (tubing) is soft and supple. Discoloration of the mask hoses occurs with the passage of time and is not cause for removal of the mask assembly. Replace mask assembly as required.

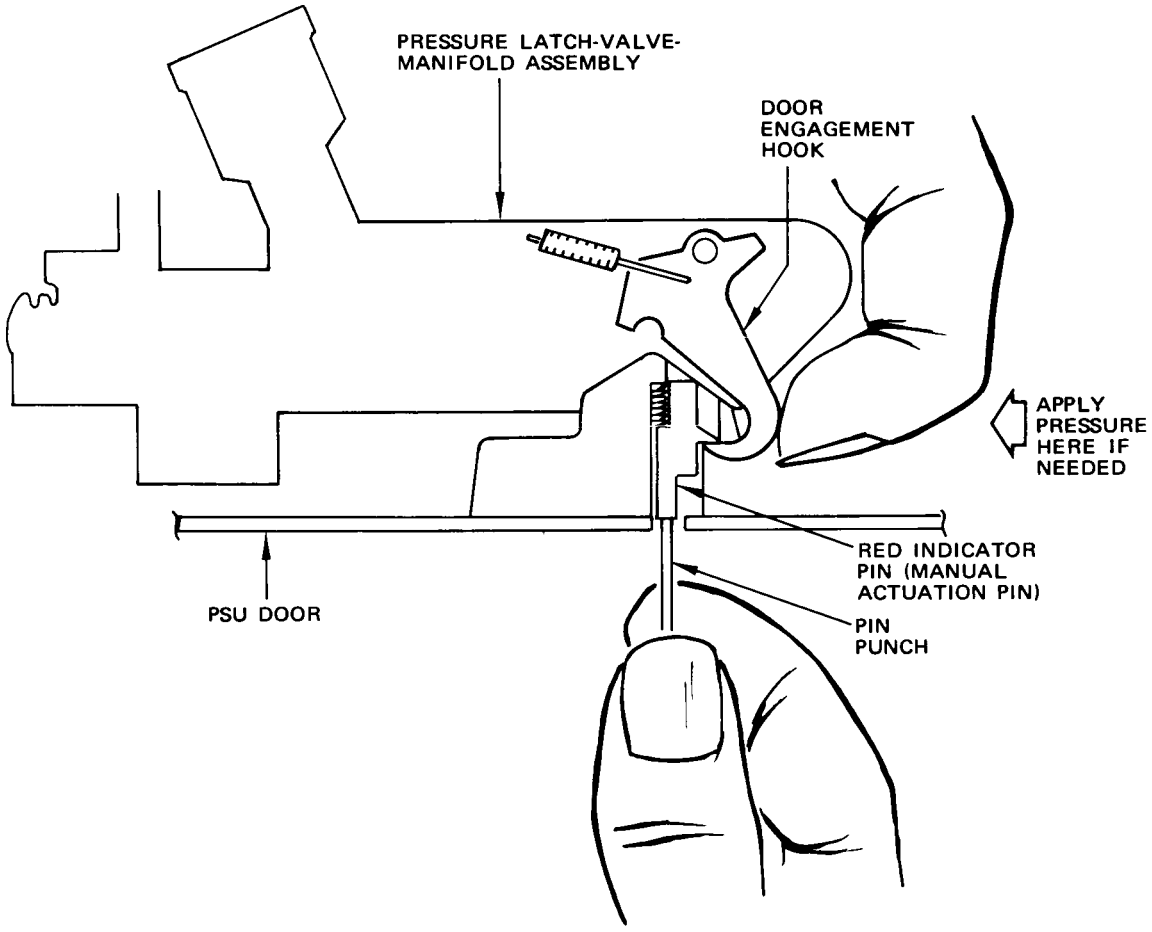
   B. Using pin punch, push in pin recessed into hole in PSU door to open latch.
   C. Lower PSU. Refer to Chapter 25, PSU - MP.
   D. Remove tape and remove oxygen mask box cover.
   E. Insert mask tubes through tube guide, and push far enough for tubes to form large loops above guide.
   F. Insert valve nozzles into tube guide.
   G. Connect mask tubes onto valve nozzles, pushing as far as possible.
   H. Tie each tube to nozzle with a plastic strap using special tool. Gently tighten loops.
   I. Insert each valve actuating pin firmly into hole in its valve until the detent engages.



Valve Actuating Pin Installation
Figure 401



Preparation of Mask Assembly
Figure 402



Resetting Red Indicator Pin
Figure 403

J. Starting with mask assembly No. 4 (Fig. 404), pull each mask and its tubing coil up through stowage box, letting coils rest on PSU, and letting each mask hang over inboard edge of PSU (Fig. 405).

K. Close oxygen mask box door. Using pin punch, reset red indicator pin by pushing just below door until it clicks into engagement with hook (Fig. 403).

L. Install mask No. 1.
   (1) Place facepiece No. 1 (forward mask) face down on closed door in forward inboard corner of oxygen mask box.
   (2) Lay headstrap on reservoir bag.
   (3) Fold reservoir bag No. 1 twice crosswise and place on top of facepiece, with tube end along outboard surface of facepiece near the top (Fig. 406).

       NOTE: Headstrap will now be in the folds of the reservoir bag.

   (4) Place tubing coil No. 1 above its reservoir bag so that it overlaps aft side of bag and facepiece.

       CAUTION: DO NOT PUSH RESERVOIR BAG OR FACEPIECE INTO TUBING COIL. IF RESERVOIR BAG OR FACEPIECE ARE PUSHED INTO TUBING COIL, MASK MAY NOT DROP.

M. Install mask No. 2.
   (1) Place facepiece No. 2 face down on closed door, outboard of facepiece No. 1.
   (2) Lay headstrap on reservoir bag.
   (3) Fold reservoir bag No. 2 twice crosswise, and place it on its facepiece, with tube end along aft surface of facepiece near the top.

       NOTE: Headstrap will now be in the folds of the reservoir bag.

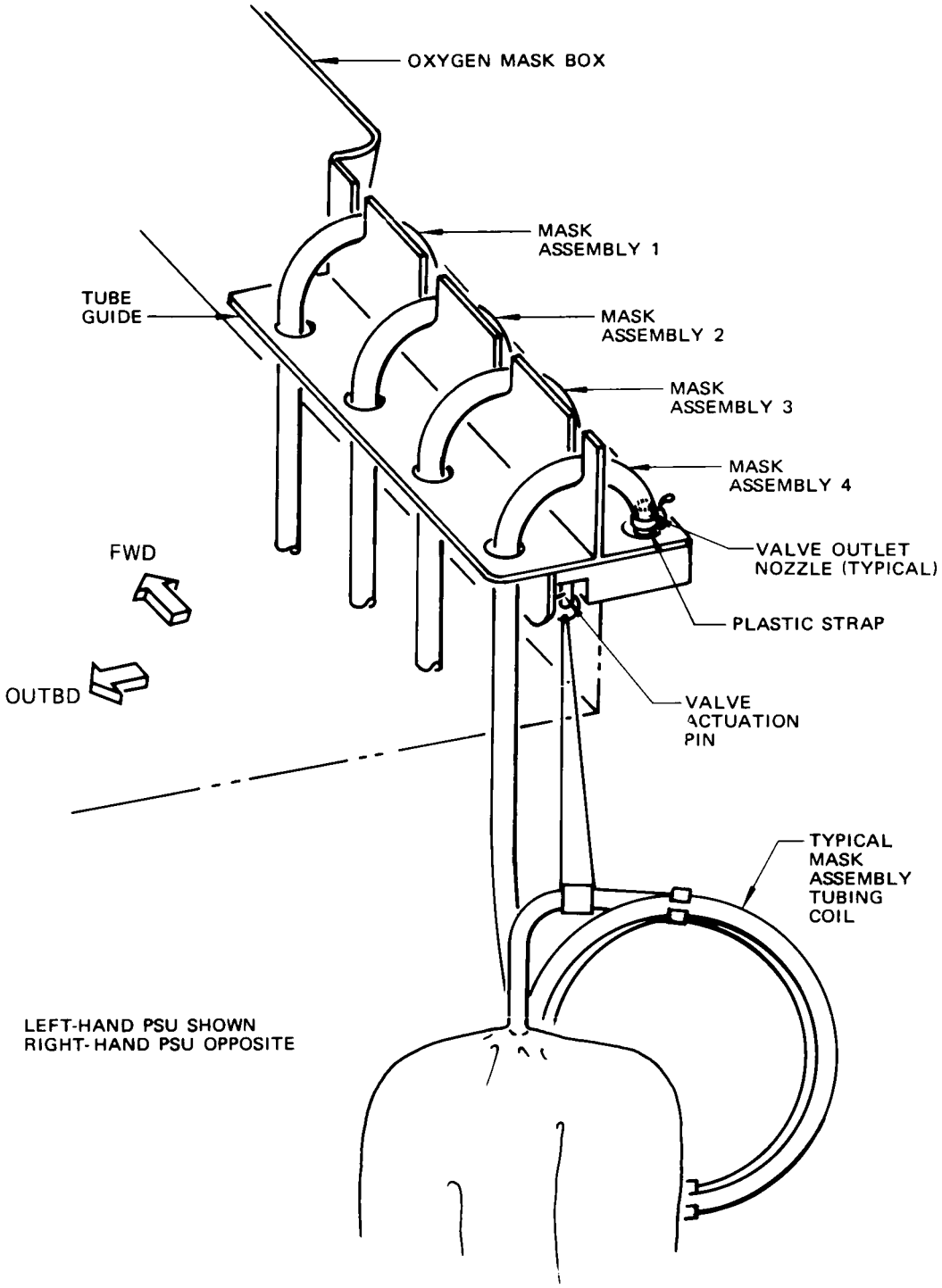
   (4) Place tubing coil No. 2 on top so that it overlaps aft side of coil No. 1.

N. Install mask No. 3.
   (1) Place facepiece No. 3 face down on door aft of facepiece No. 2.
   (2) Lay headstrap on reservoir bag.
   (3) Fold reservoir bag No. 2 twice crosswise and place on top of facepiece with tube end along aft surface of facepiece near the top.

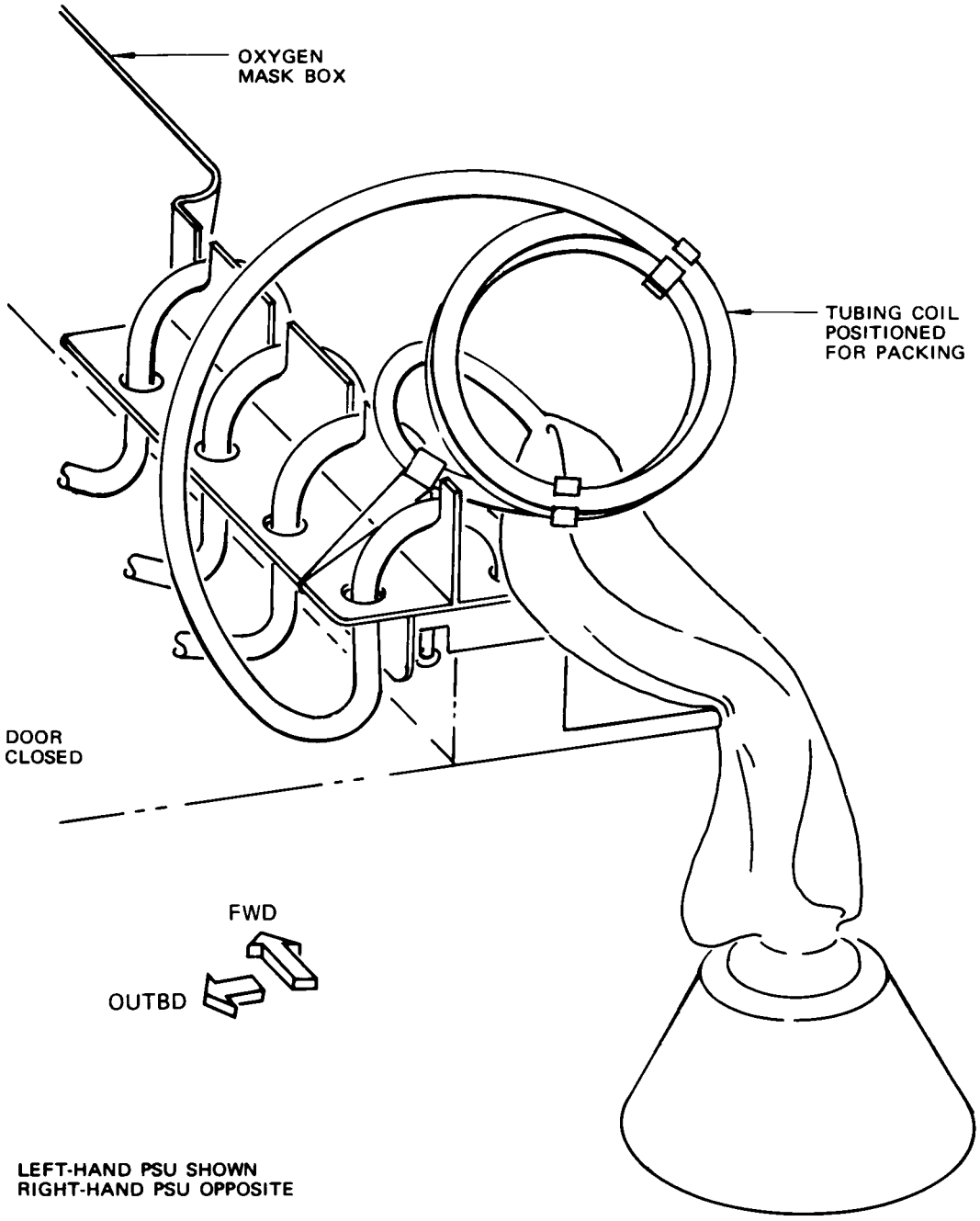
       NOTE: Headstrap will now be in the folds of the reservoir bag.

   (4) Place tubing coil No. 3 so that it overlaps aft side of coil No. 2.

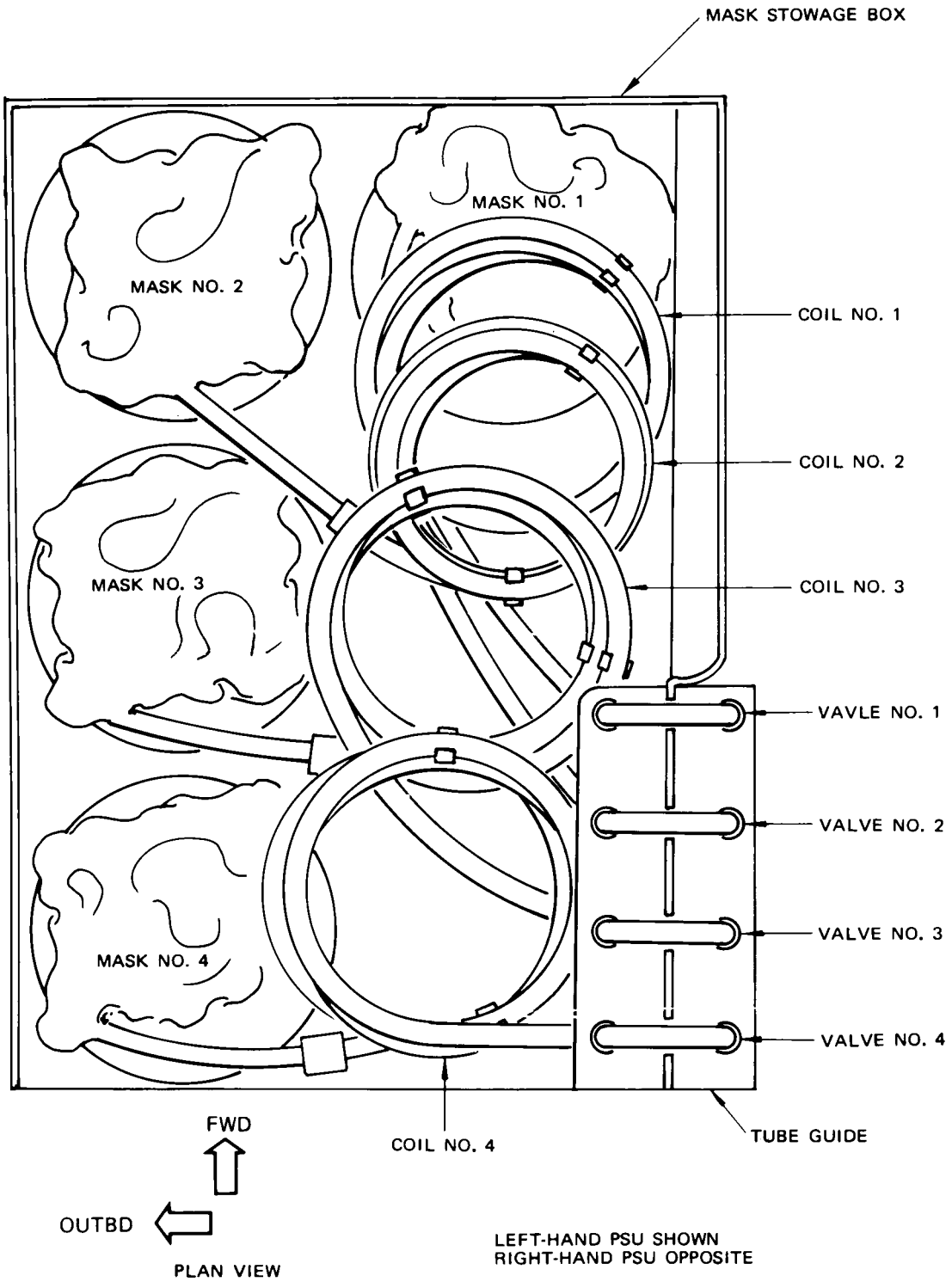
O. Install mask No. 4.
   (1) Place facepiece No. 4 face down on door aft of facepiece No. 3.



Attaching Mask Assemblies to Valves
Figure 404



Mask Assemblies Ready for Packing in Stowage Box
Figure 405



Mask Assemblies Installed in Stowage Box
Figure 406

(2) Lay headstrap on reservoir bag.
(3) Fold reservoir bag No. 4 twice crosswise and place it on top of its mask with tube end along aft surface of facepiece near the top.

NOTE: Headstrap will now be in the folds of the reservoir bag.

(4) Place tubing coil No. 4 on top so that it overlaps aft side of coil No. 3.

P. Make sure that all tubing coils and reservoir bags are placed in an orderly manner so that masks will drop when door is opened (Fig. 406).
Q. Replace oxygen mask box cover and attach with vinyl tape. Make sure that no reservoir bags, tubing, or headstraps are caught under edge of cover.
R. Raise service unit and latch (Ref Chapter 25, Passenger Service Unit - Maintenance Practices).

PASSENGER SERVICE UNIT OXYGEN MASKS - INSPECTION/CHECK

1. General
   A. The oxygen mask compartment door latch incorporates a red indicator pin which is normally recessed inside a hole in the door. This is achieved by resetting the pin after installing the oxygen masks.
   B. If the pin is showing on any PSU, then one or more of the following conditions is the probable cause.
      (1) The masks are improperly packed.
      (2) The door latch is out of adjustment.
2. Check Mask Installation
   A. Visually check PSU's for protruding red indicator pins.
      (1) Drop mask door and remove oxygen masks (Ref 35-21-52, R/I).
      (2) Check adjustment of door latch (Ref 35-21-92, M/P).
      (3) Repack masks and reset red indicator pin (Ref 35-21-52, R/I).

OXYGEN MASKS - INSPECTION/CHECK

1. General
   A. This procedure applies to oxygen mask hoses and oxygen mask bags installed in all service units.
   B. These visual checks should be accomplished every time the mask assemblies are exposed for maintenance.
   C. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outline in 35-00, Maintenance Practices.
2. Inspect Oxygen Mask Hoses and Bags
   A. Manually open service unit door and allow masks to fall free.
   B. Visually examine the oxygen mask hoses and oxygen masks bags for the presence of liquid contaminants on the inside and outside surfaces.
      (1) If there are liquid contaminants found, replace the oxygen masks assembly.

          NOTE: A liquid substance on the inside or outside surfaces may indicate the diffusion of phthalate plasticizer, a substance used to make the material flexible over the normal operating temperature range. The plasticizer can diffuse out of the material due to aging, thermal effects and humidity.

   C. Carefully examine the mask hoses. Replace if mask hoses are no longer soft and supple. Discoloration of tubing occurs with the passage of time and is not cause for removal of the mask assembly.
   D. Repack masks.

OXYGEN MASKS - CLEANING/PAINTING

1. Oxygen Mask Cleaning
   A. General
      (1) Respiratory equipment should be cleaned and disinfected after individual use. Oxygen mask facepieces are made of material that can be cleaned and disinfected in one operation by using a combination cleaning and disinfecting detergent.
   B. Equipment and Materials
      (1) Detergent disinfectant product commercially obtained (use one of the following):
         (a) Airwick Antimicrobial Topical Gel
         (b) West Wescodyne
         (c) Lysol Brand Disinfectant (EPA Registration Number 675-19)
      (2) Absorbent cheesecloth
      (3) Sponge applicator (optional)
      (4) Isopropyl Alcohol
   C. Clean Oxygen Mask Facepiece
      (1) Mix a solution of detergent disinfectant product with warm water. (Follow dilution instructions as found on the product label).
      (2) Apply solution to face piece with absorbent cheesecloth or sponge applicator.
      (3) Rinse in clear, warm water.
      (4) Allow to air-dry, or dry with cloth.
      (5) Reassemble and package.

LAVATORY SERVICE UNIT OXYGEN MASKS - REMOVAL/INSTALLATION

1. General
   A. Prior to installing oxygen masks check that mask is clean. For mask cleaning instructions refer to 35-21-59.
2. Equipment and Materials
   A. Plastic coil retainers
3. Remove Lavatory Service Unit Masks
   A. Open service unit door by actuating release pin.
   B. Disconnect masks.
      (1) Pull valve-actuating pins out of engagement with outlet valves. (Fig. 401)
      (2) Pull hoses off nozzles.
      (3) Remove valve-actuating pins from their actuating attachments.
      (4) Reinsert valve-actuating pins into outlet valves.
      (5) On masks with PULL placards (Fig. 402), disconnect PULL placard lanyard from mask frame.
4. Prepare Lavatory Service Unit Masks for Installation

   NOTE: Prior to installing oxygen masks, check that mask hoses (tubing) is soft and supple. Discoloration of the mask hoses occurs with the passage of time and is not cause for removal of the mask assembly. Replace mask assembly as required.

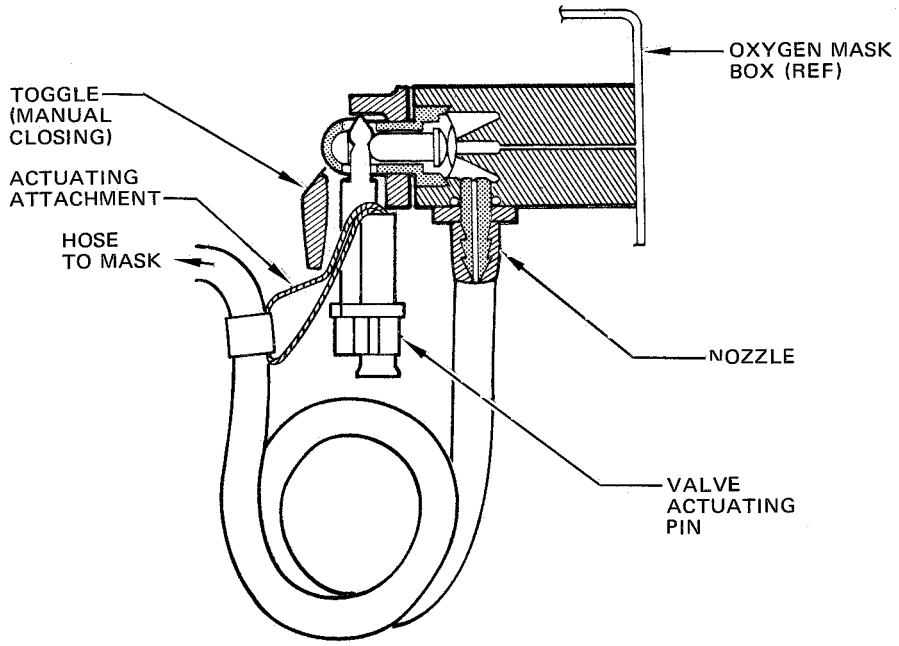
   A. On masks with PULL placards, tie PULL placard lanyard to mask frame using bowline knot. Clip loose end of lanyard short.
   B. Attach two plastic coil retainers to tubing, one to each side of valve actuating attachment, each at about 2-1/2 inches from attachment.
   C. Beginning with reservoir bag end, wind tubing to about 2-1/2 coils. Keep dimensions and arrangement as shown in Fig. 402.

      NOTE: Mask with clockwise-wound coil will be called "mask assembly A." Opposite mask (counterclockwise coil) will be called "mask assembly B."

   D. Attach valve actuation pin to valve actuating attachment. Install plastic guard.

      NOTE: Valve actuation pins may be either short or long. Figure 402 shows typical attachment of each kind.

5. Install Lavatory Service Unit Masks
   A. Manually open stowage compartment door.
   B. Connect hoses to their respective nozzles.
   C. On masks with PULL placards, with mask hanging, verify that PULL placard is within the forward vision of the seated occupant.



Valve Actuating Pin Installation
Figure 401

D. Place coil of mask assembly B into stowage compartment, and insert valve actuating pin firmly into valve B until detent is engaged (Fig. 403).

NOTE: Valve end of tubing must lie in corner of compartment adjacent to valve, and valve actuating pin must be located toward nearest compartment sidewall.

E. Repeat step D with mask assembly A, placing coil A over coil B.
F. Lay each headstrap on its reservoir bag.
G. Fold each reservoir bag three times lengthwise.

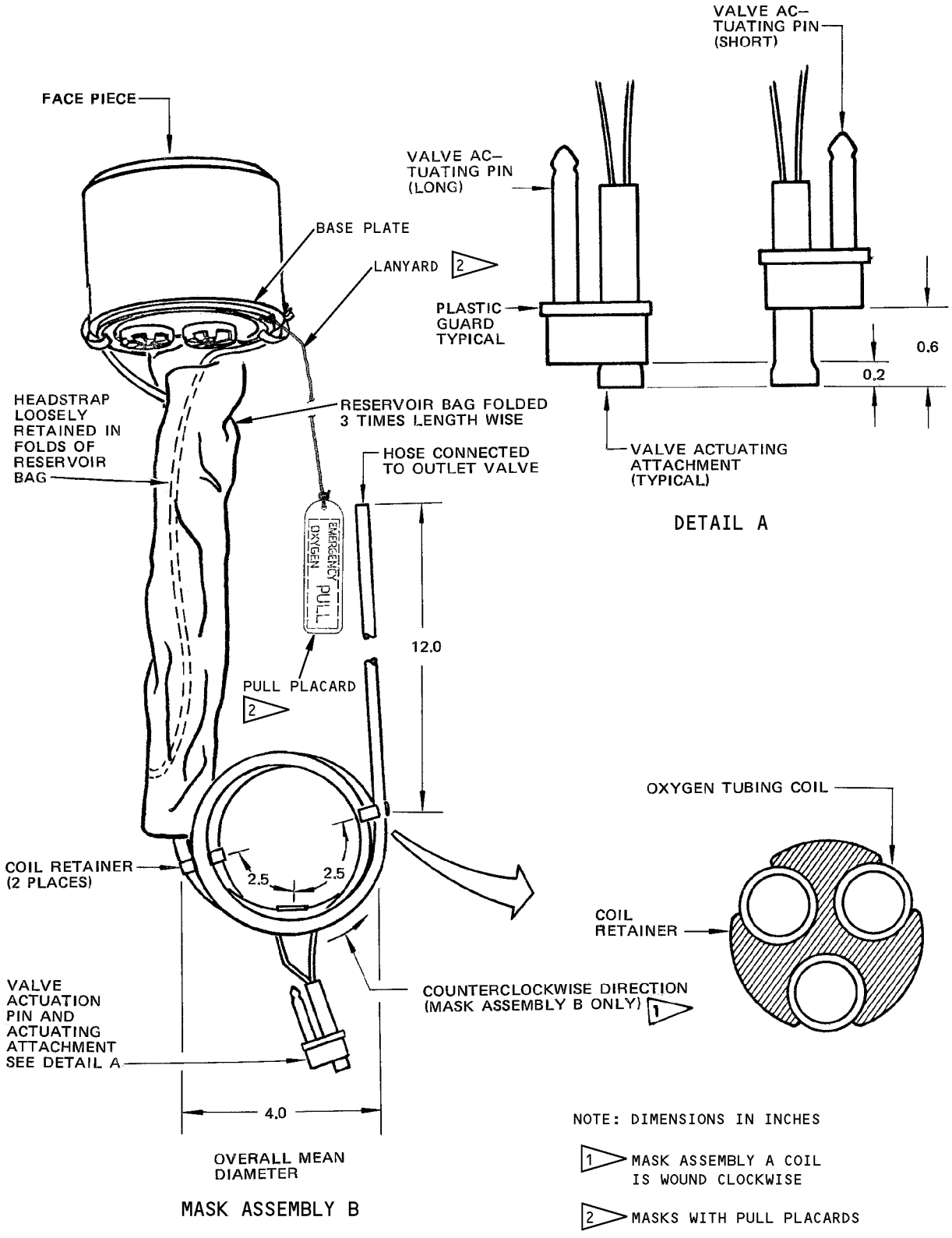
NOTE: Headstrap will now be in folds of reservoir bag.

H. Coil reservoir bag of mask assembly A onto coils already in stowage compartment. Use mask facepiece to hold coils in place, with open end of facepiece downwards.
I. Place hard back of mask B directly onto mask A, with open end of mask B facing downwards.

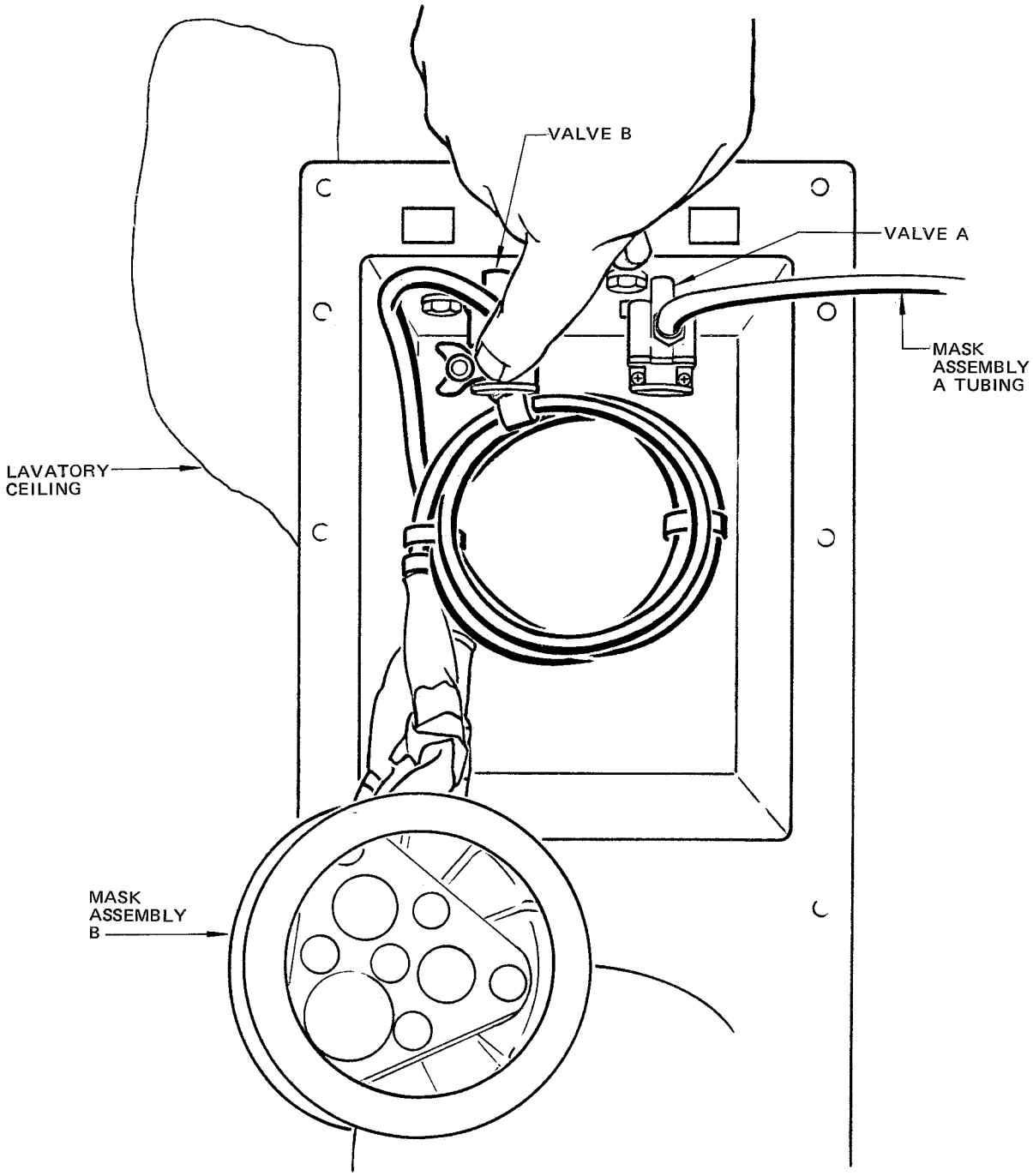
NOTE: Let reservoir bag B fold freely into corner at compartment end opposite outlet valves. Check that no tubing falls to side of facepieces, and that facepieces are clear of outlet valve manifold.

J. Check that tubing is correctly ducted from valves and that valve-actuating pins are secure.
K. On masks with PULL lanyards, coil lanyard and PULL placard. Hold coils against mask stowage compartment door.
L. Close the mask stowage compartment door.

NOTE: Slide hand out carefully to maintain correct stowage of masks. Make sure that door and latch are fully engaged.



Lavatory Service Unit Mask - Preparation for Installation
Figure 402



Lavatory Service Unit Mask Installation
Figure 403

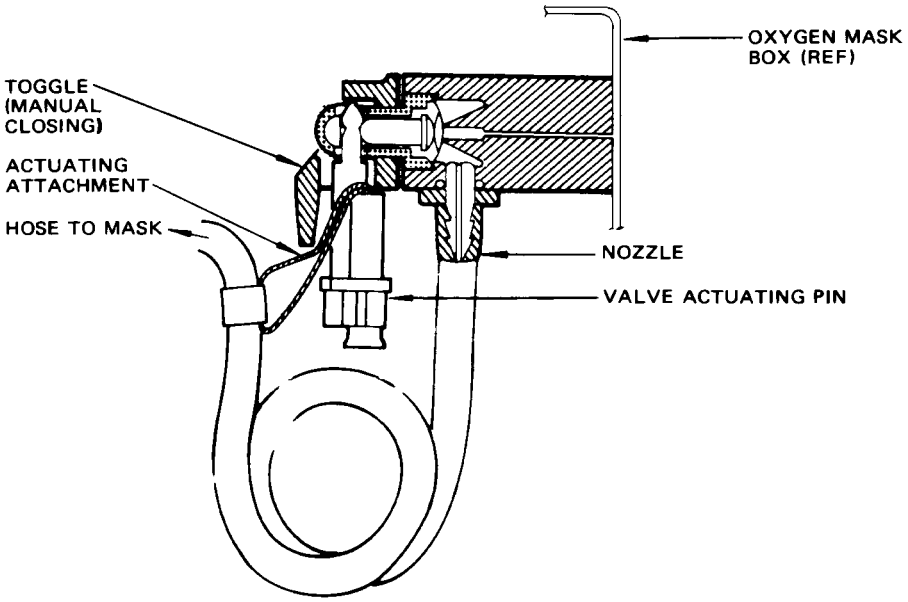
ATTENDANTS' SERVICE UNITS OXYGEN MASKS - REMOVAL/INSTALLATION

1. General
   A. Removal/Installation of aft attendants service unit masks and forward attendants service unit masks are nearly identical. The differences, which appear during mask installation, are noted in the following procedure.
   B. Prior to installing oxygen masks check that mask is clean. For mask cleaning instructions refer to 35-21-59.
2. Equipment and Materials
   A. Plastic coil retainers
3. Remove Attendants' Service Unit Masks
   A. Open service unit door by actuating release pin.
   B. Disconnect masks.
      (1) Pull valve actuating pins out of engagement with outlet valves (Fig. 401).
      (2) Pull hoses off nozzles.
      (3) Remove valve actuating pins from their actuating attachments.
      (4) Reinsert valve actuating pins into outlet valves.
      (5) On aft attendant's masks, remove PULL placard lanyard from mask frame.
4. Install Attendant's Service Unit Masks
   A. Prepare Masks (Fig. 402)

      WARNING: VERIFY CORRECT MASK PART NUMBER. IMPROPER PART MAY CAUSE INACCESSABILITY OF MASK TO ATTENDANT WHEN MASK IS DEPLOYED.

      NOTE: Prior to installing oxygen masks, check that mask hoses (tubing) is soft and supple. Discoloration of the mask hoses occurs with the passage of time and is not cause for removal of the mask assembly. Replace mask assembly as required.

      (1) General
         (a) For simplification purposes, mask assemblies after preparation are divided into two different types, designated as "mask assembly A" or "mask assembly B."
         (b) Corresponding outlet valves are also designated A or B (Fig. 403).
      (2) Prepare mask assembly A.
         (a) On aft attendant's mask, tie PULL placard lanyard to mask frame using a bowline knot. Clip loose end of lanyard short.
         (b) Wind coils clockwise per dimensions in Fig. 402.
            1) Keep clips diagonally opposite each other.
            2) Continue to build up coils evenly on top of one another until one and a half coils are held between the two clips.



Valve Actuating Pin Installation
Figure 401

3) Adjust to dimensions of Fig. 402.
4) Clip valve actuating pin to actuating attachment and join them with clamp supplied.

(3) Prepare mask assembly B.
(a) Repeat procedure for mask assembly A (above), but wind coils counterclockwise.

B. Stow Masks (Fig. 403)
(1) Manually open stowage compartment door.
(2) Connect hoses to their respective nozzles.
(3) Insert mask B valve actuating pin firmly into valve B until detent is engaged (Fig. 401).

NOTE: Valve end of tubing must lie in corner of compartment adjacent to valve, and valve actuating pin must be located toward nearest compartment sidewall.

(4) Repeat step (3) with mask assembly A.
(5) On forward attendant's masks, with mask hanging, verify mask is within reach of a seated cabin attendant.
(6) On aft attendant's masks, with masks hanging, verify that PULL placard is within the forward vision of a seated cabin attendant.
(7) Place mask coil B into stowage compartment. Place coil A over coil B.
(8) Lay each headstrap on its reservoir bag.
(9) Fold each reservoir bag three times lengthwise.

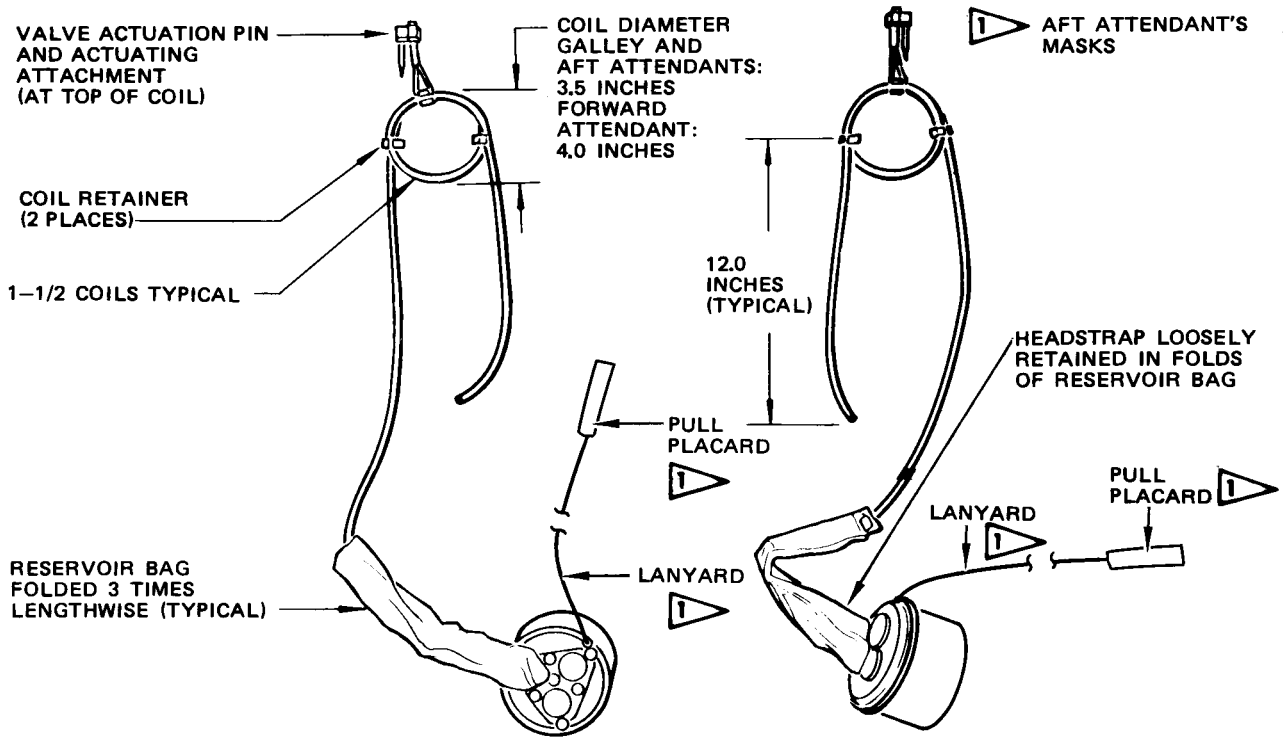
NOTE: Headstrap will now be in folds of reservoir bag.

(10) For aft attendants service unit proceed as follows:
(a) Keeping tubing lengths together, coil remaining tubing onto coils already in stowage compartment (Fig. 403, Step 2).

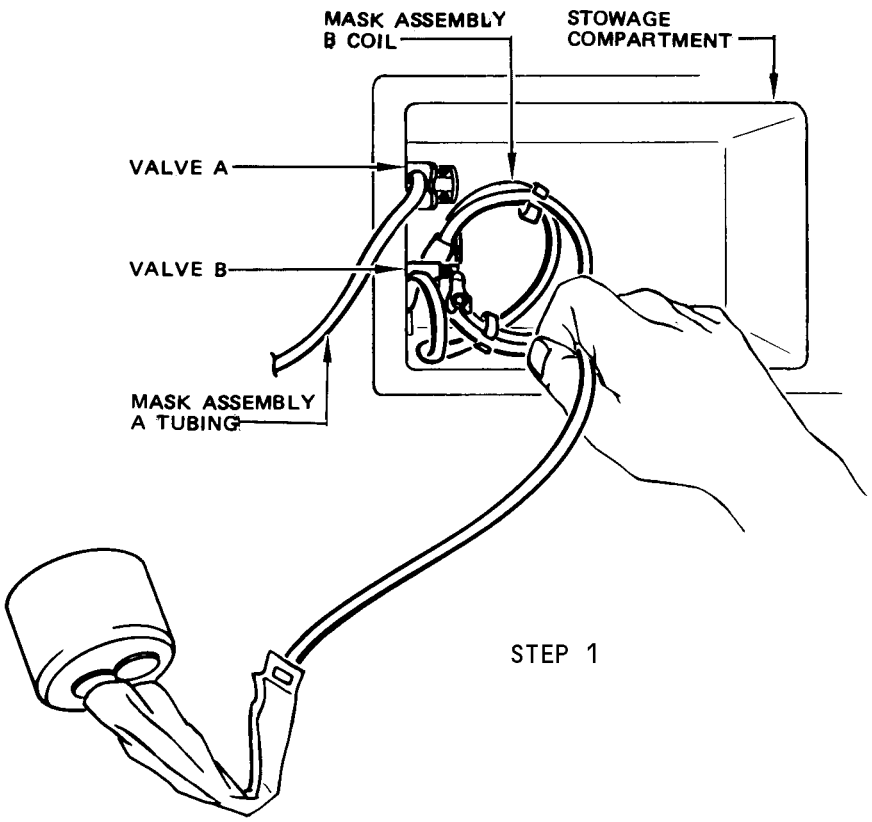
NOTE: Reservoir bags and facepieces should hang free.

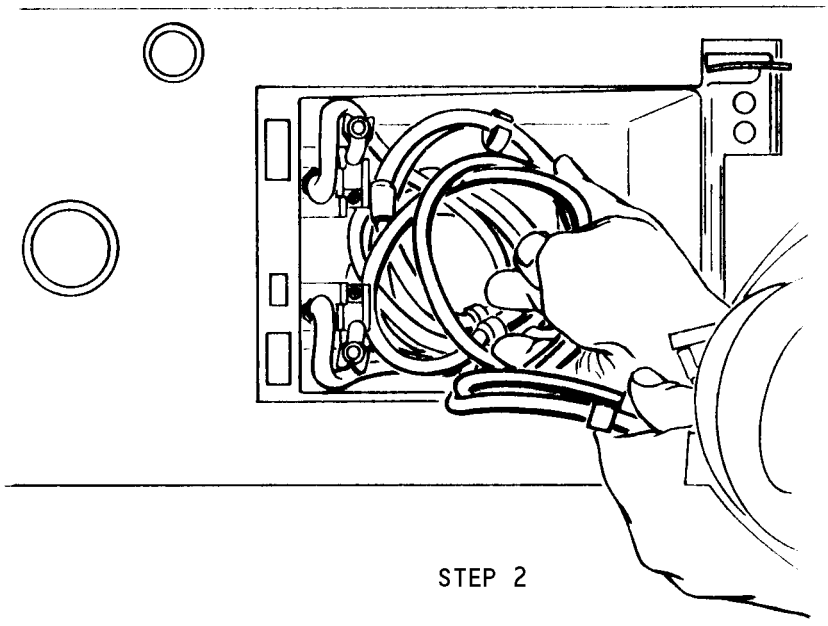
(b) Coil reservoir bag B onto tubing coils. Bring hard back of facepiece B onto coils and bag, with open end of facepiece B facing down.
(c) Bring hard back of facepiece A onto open end of facepiece B, stowing reservoir bag between facepiece A and compartment sidewall opposite from valves.

(11) For forward attendants service unit proceed as follows:
(a) Coil remaining tubing and reservoir bags of mask assemblies onto coils already in stowage compartment. Use one mask facepiece to hold coils and bags in place, with open end of facepiece downward (Fig. 403, Step 2).



Attendant's Service Units Oxygen Mask Preparation
Figure 402





Attendant's Service Unit Oxygen Mask Installation
Figure 403

(b) Place hard back of second mask facepiece directly on mask already stowed.
(c) Place reservoir bag of second mask on far side of mask from valve manifold.

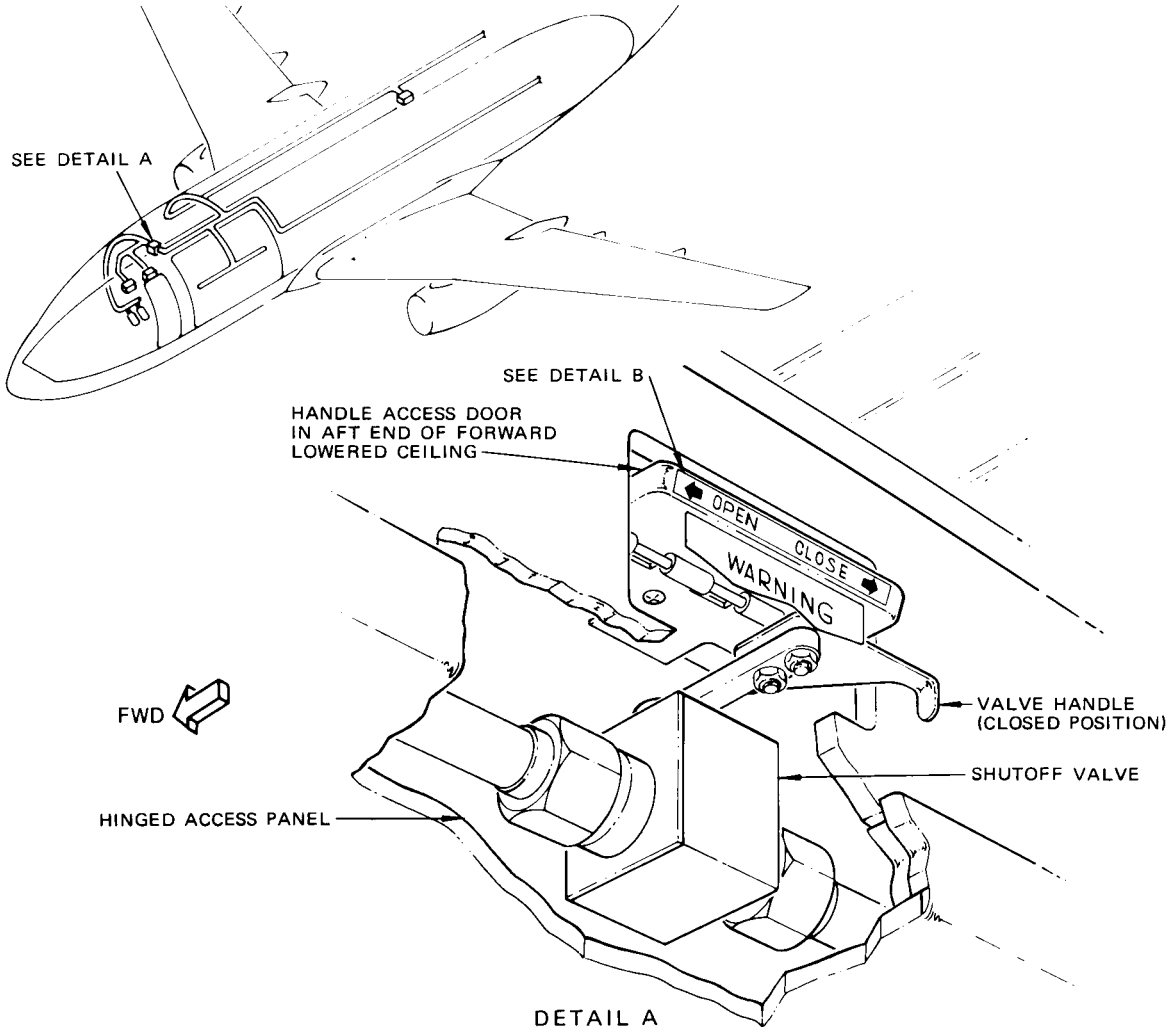
(12) Make sure that all tubing is above facepieces, and that facepieces are clear of manifold, with both open ends facing down.
(13) Check that tubing is correctly ducted from the valves and that valve actuating pins are secure.
(14) On aft attendant's masks, coil lanyard and PULL placards. Hold coils against mask stowage compartment door.
(15) Close mask stowage compartment door.

NOTE: Slide handout carefully to maintain correct position of masks. Make sure that door and latch are fully engaged.

PASSENGER OXYGEN SYSTEM SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General
   A. The shutoff valve is located at the aft end of the forward lowered ceiling (Fig. 401).
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials).
3. Remove Passenger Oxygen System Shutoff Valve
   A. Close passenger oxygen cylinders shutoff valve(s).
   B. Gain access to oxygen system shutoff valve.
      (1) Rotate the horizontal panel of the cap at the aft end of the forward lowered ceiling down and aft to gain access to the valve.
   C. Close valve (Fig. 401).
   D. Disconnect line connections.
   E. Plug or cap open connections.
4. Install Passenger Oxygen System Shutoff Valve
   A. Connect line connections.
   B. Make sure valve is closed and handle is pointing directly aft (Fig. 401).
   C. Open valve.
   D. Test connections for leaks using leak detection compound (Ref 35-21-0, Adjustment/Test).
   E. Close access panel.
   F. Slowly open passenger oxygen cylinder shutoff valve(s).

      WARNING: VALVE(S) MUST BE OPEN SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.



Passenger Oxygen System Shutoff Valve Installation
Figure 401

PASSENGER SERVICE UNIT PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. General
   A. The assembly is installed on the aft side of the oxygen mask box below the gasper air plastic tube.
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials)
3. Prepare to Remove Pressure Latch-Valve-Manifold Assembly
   A. Close passenger oxygen cylinders shutoff valve(s).
   B. Open call light lens release latch, and lower passenger service unit (Ref Chapter 25, Passenger Service Unit - Maintenance Practices).
   C. Open oxygen mask stowage box cover (Fig. 401).
   D. Remove masks from box but do not disconnect mask hoses.

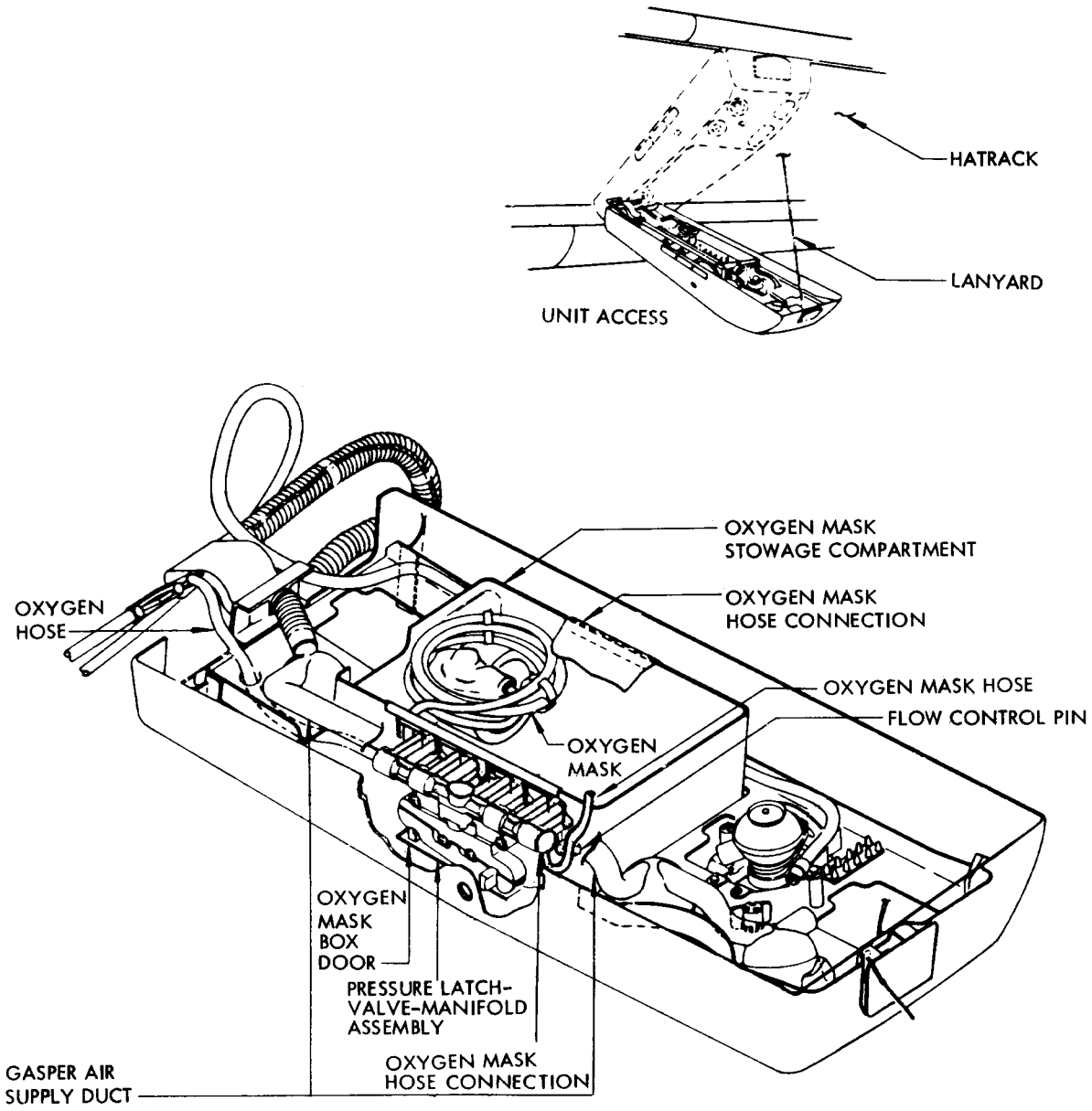
      CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

   E. Manually open passenger service unit oxygen mask door.
   F. Remove screw, collar, and nutplate to free gasper air supply duct clamp.
   G. Remove gasper by pulling aft.
4. Remove Pressure Latch-Valve-Manifold Assembly
   A. Disconnect mask hoses from nozzle.
   B. Remove flow control pins and remove mask assemblies.
   C. Disconnect nut attaching flexible supply hose to pressure latch-valve-manifold assembly.

      NOTE: Hold oxygen inlet fitting with a wrench when disconnecting oxygen line to prevent fitting from being loosened from manifold.

      CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

   D. From inside of oxygen mask box remove screws attaching latch-valve-manifold assembly to box.
   E. Remove latch-valve-manifold assembly.
5. Install Pressure Latch-Valve-Manifold Assembly
   A. Position latch-valve manifold assembly on oxygen mask box and loosely install screws.
   B. Gently close oxygen mask box door and ensure it aligns properly with passenger service unit.



Pressure Latch-Valve-Manifold Installation
Figure 401

C. Hold door in this position and tighten screws.

CAUTION: AVOID EXCESSIVE TIGHTENING OF SCREWS, WHICH MAY CAUSE BINDING OR STICKING OF LATCH.

D. Check operation of door by opening and closing several times.
E. Connect flexible supply hose to latch-valve-manifold assembly.

NOTE: Hold oxygen inlet fitting with a wrench when connecting oxygen line to prevent fitting from being loosened from manifold.

F. Install masks (Refer to Passenger Service Unit Oxygen Masks - Removal/Installation).
G. Test connection for leaks using leak detection compound (Ref 35-21-0, Adjustment/Test).

6. Restore Airplane to Normal Configuration
A. Install gasper air supply duct. Attach clamp to box with screw, collar, and nutplate.
B. Raise and latch passenger service unit and install call light lens (Ref Chapter 25, Passenger Service Unit - Maintenance Practices).
C. Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

PASSENGER SERVICE UNIT PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials)
2. Remove Pressure Latch-Valve-Manifold Assembly
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
   B. Close passenger oxygen cylinders shutoff valve(s).
   C. Obtain access to pressure latch-valve-manifold assembly.
      (1) Lower passenger service unit (Ref Chapter 25, Passenger Service Units - Maintenance Practices).
      (2) Open oxygen mask stowage box cover (Fig. 201).
      (3) Remove masks from box but do not disconnect mask hoses.

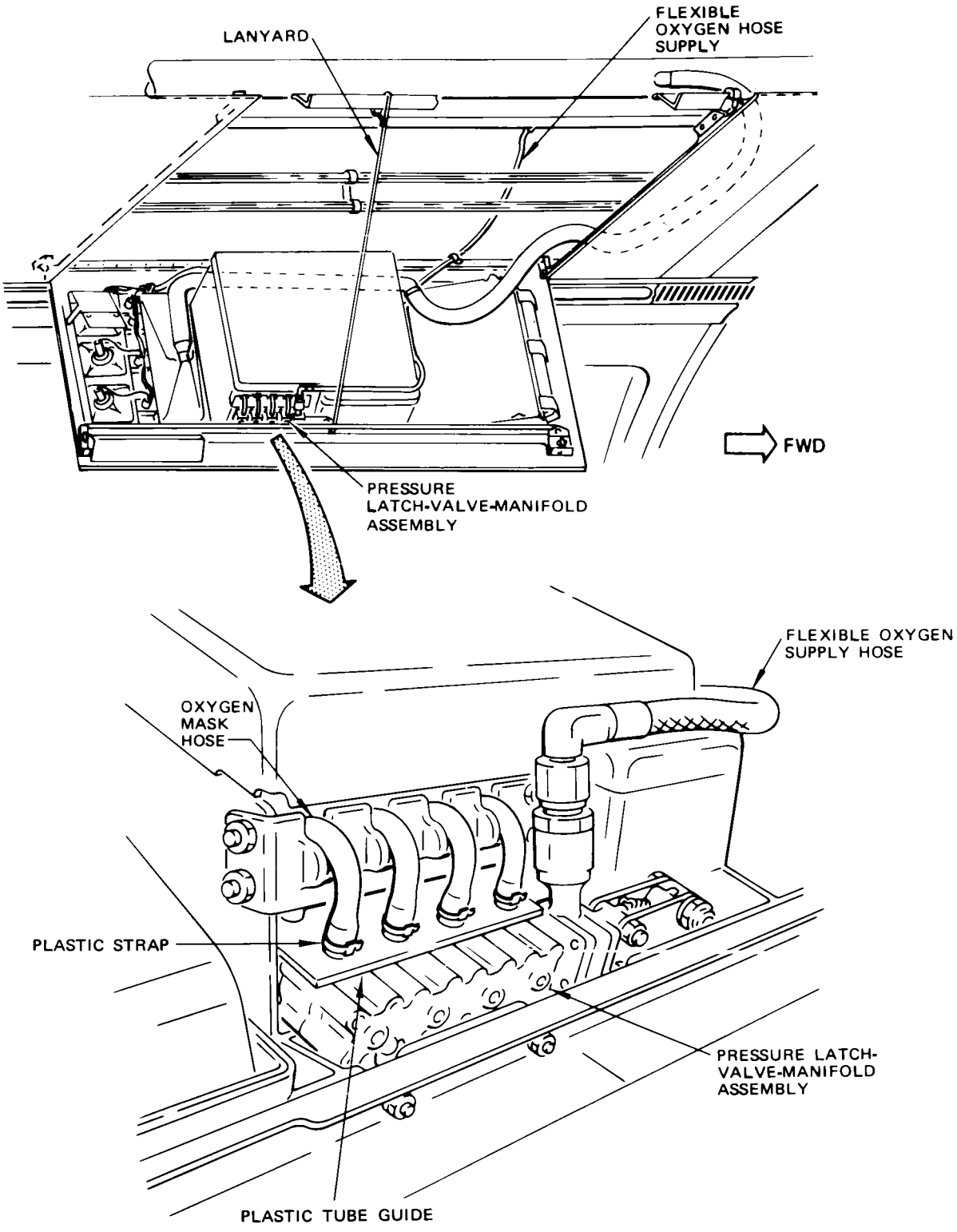
          CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

      (4) Manually open passenger service unit oxygen mask door.
   D. Remove assembly.
      (1) Cut and remove plastic straps and disconnect mask hoses from nozzle.
      (2) Remove flow control pins and remove mask assemblies.
      (3) Disconnect nut attaching flexible supply hose to pressure latch-valve-manifold assembly.

          CAUTION: DO NOT TWIST, INK, OR PINCH HOSES.

          NOTE: Hold oxygen inlet fitting with a wrench when disconnecting oxygen line to prevent fitting from being loosened from manifold.

      (4) From inside of oxygen mask box remove screws attaching latch-valve-manifold assembly to box.
      (5) Remove latch-valve-manifold assembly.
      (6) Remove plastic tube guide.
3. Install Pressure Latch-Valve-Manifold Assembly
   A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
   B. Position latch-valve-manifold assembly on oxygen mask box and loosely install screws.
   C. Gently close oxygen mask box door and ensure it aligns properly with passenger service unit.



Pressure Latch-Valve-Manifold Installation
Figure 401

D. Hold door in this position and tighten screws.

CAUTION: AVOID EXCESSIVE TIGHTENING OF SCREWS, WHICH MAY CAUSE BINDING OR STICKING OF LATCH.

E. Check operation of door by opening and closing several times.
F. Connect flexible supply hose to latch-valve-manifold assembly.

NOTE: Hold oxygen inlet fitting with a wrench when connecting oxygen line to prevent fitting from being loosened from manifold.

G. Install masks (Ref Passenger Service Unit Oxygen Masks - Removal/Installation).
H. Test connection for leaks (Ref 35-21-0, Adjustment/Test).
I. Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

4. Adjustment /Test of Pressure Latch-Valve-Manifold Assembly
A. With oxygen masks removed, PSU in raised position, and oxygen mask box door closed; very gently push upward on oxygen mask box door in area of red indicator pin and check that a slight give is felt.

NOTE: Do not push upward so firmly that oxygen mask box door is distorted.
Airplane vibrations on a too tightly installed pressure latch wil1 cause red indicator pin to disengage from detent.

B. If necessary, loosen fasteners and adjust pressure latch to meet above requirement.

FORWARD ATTENDANTS' SERVICE UNIT PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. General
   A. The pressure latch-valve-manifold assembly is installed on the lower side of the oxygen mask box. The service unit is attached to the forward entry door attendant's service panel, which must be lowered to gain access to the latch-valve-manifold assembly. The panel is hinged at its lower edge and attached by quick-release fasteners at its top edge. The panel is mounted above the forward entry door.

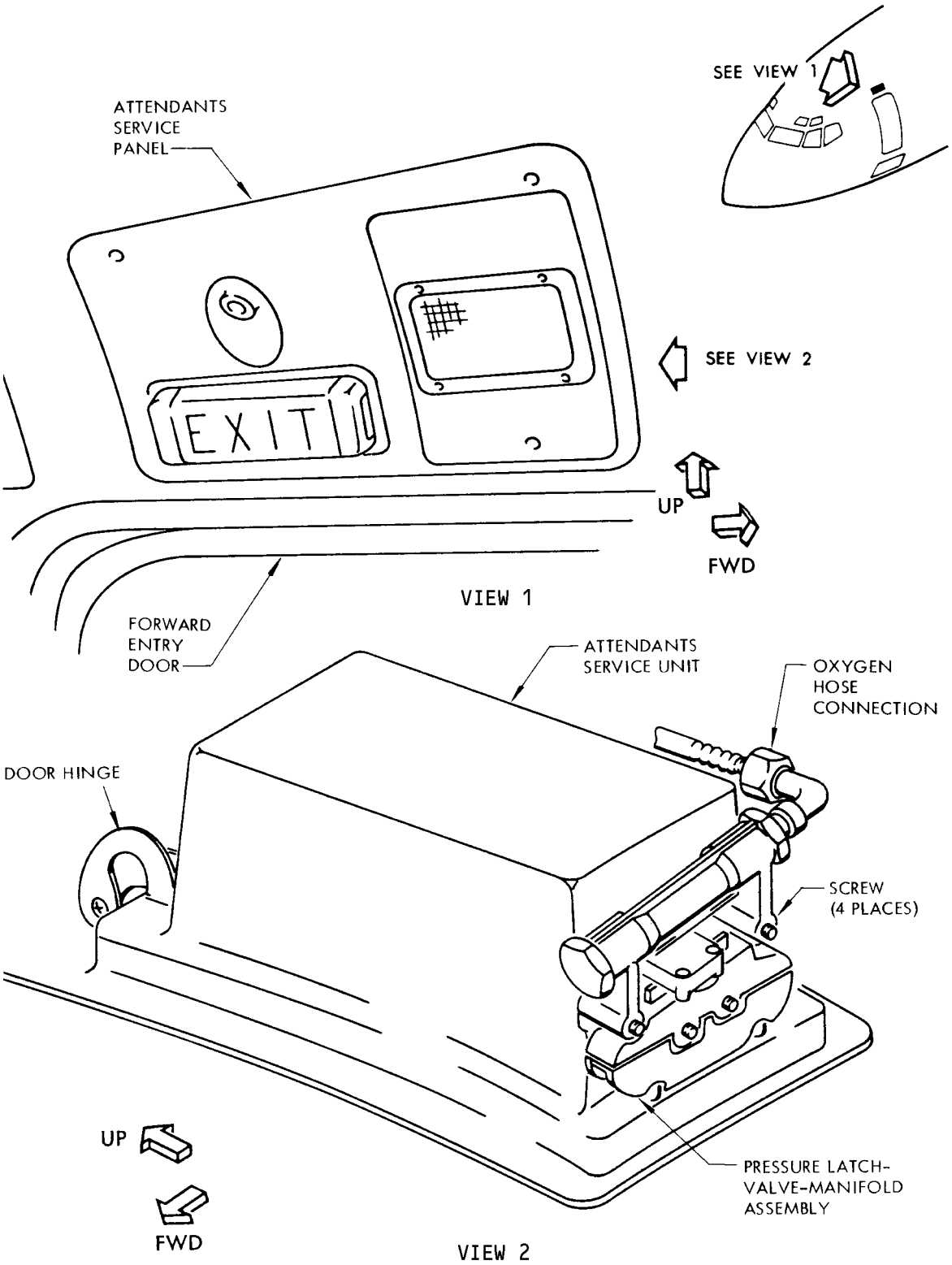
      NOTE: The service panel supports the attendant's work light and the emergency exit light.

   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials)
3. Prepare to Remove Pressure Latch-Valve-Manifold Assembly
   A. Close passenger oxygen cylinders shutoff valve(s).
   B. Disengage quick-release fasteners and lower forward entry door attendant's service panel (Fig. 401).
   C. Actuate release pin to open oxygen mask box door. Masks will drop.
4. Remove Pressure Latch-Valve-Manifold Assembly
   A. Disconnect mask hoses from nozzle.
   B. Remove flow control pins and remove mask assemblies.
   C. Disconnect nut attaching flexible supply hose to pressure latch-valve-manifold assembly.

      NOTE: Hold oxygen inlet fitting with a wrench when disconnecting oxygen line to prevent fitting from being loosened from manifold.

      CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

   D. From inside of oxygen mask box remove screws attaching latch-valve-manifold assembly to box.
   E. Remove latch-valve-manifold assembly.
5. Install Pressure Latch-Valve-Manifold Assembly
   A. Position latch-valve-manifold assembly on oxygen mask box and loosely install screws.
   B. Gently close oxygen mask box door and insure it aligns properly with passenger service unit.



Forward Attendant's Oxygen Service Unit
Figure 401

C. Hold door in this position and tighten screws.

CAUTION: AVOID EXCESSIVE TIGHTENING OF SCREWS, WHICH MAY CAUSE BINDING OR STICKING OF LATCH.

D. Check operation of door by opening and closing several times.
E. Connect flexible supply hose to latch-valve-manifold assembly.

NOTE: Hold oxygen inlet fitting with a wrench when connecting oxygen line to prevent fitting from being loosened from manifold.

F. Install masks (Ref Forward Attendants' Service Unit Oxygen Masks - Removal/Installation).
G. Test connection for leaks using leak detection compound (Ref 35-21-0, Adjustment/Test)

6. Restore Airplane to Normal Configuration
A. Raise forward entry door attendant's service panel and attach with quick-release fasteners.
B. Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

AFT ATTENDANT'S' SERVICE UNIT PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. General
   A. The aft attendant's service unit is attached to an aft lowered ceiling panel, which must be removed for access to the latch assembly.
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials)
3. Prepare to Remove Pressure Latch-Valve-Manifold Assembly
   A. Close passenger oxygen cylinders shutoff valve(s).
   B. Actuate manual release pin to open oxygen mask box door. Masks will drop.
   C. Remove lowered ceiling panel (Fig. 401) (Ref Chapter 25, Lowered Ceilings - Removal/Installation).
4. Remove Pressure Latch-Valve-Manifold Assembly
   A. Disconnect mask hoses from nozzle.
   B. Remove flow control pins and remove mask assemblies (Fig. 402).
   C. Disconnect nut attaching flexible supply hose to pressure latch-valve-manifold assembly.

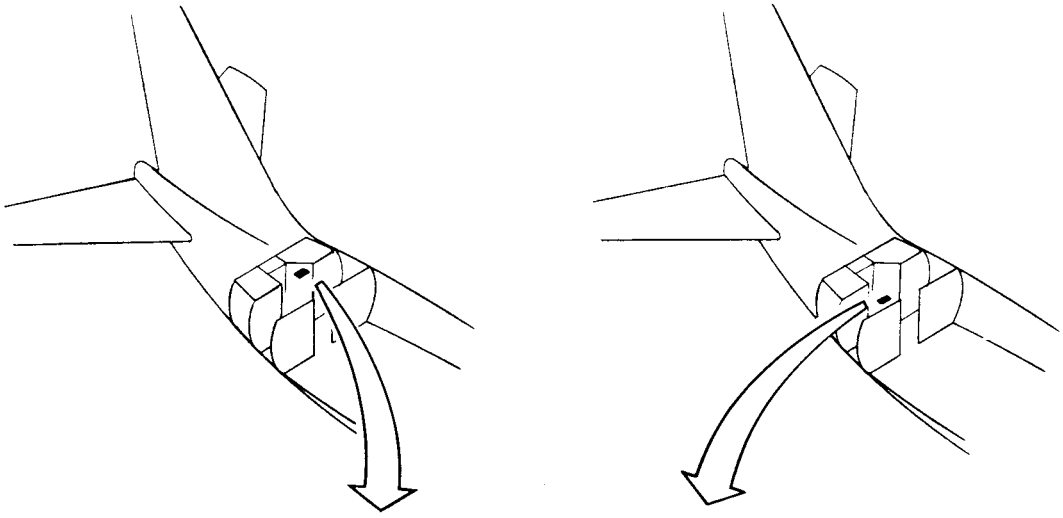
      NOTE: Hold oxygen inlet fitting with a wrench when disconnecting oxygen line to prevent fitting from being loosened from manifold.

      CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

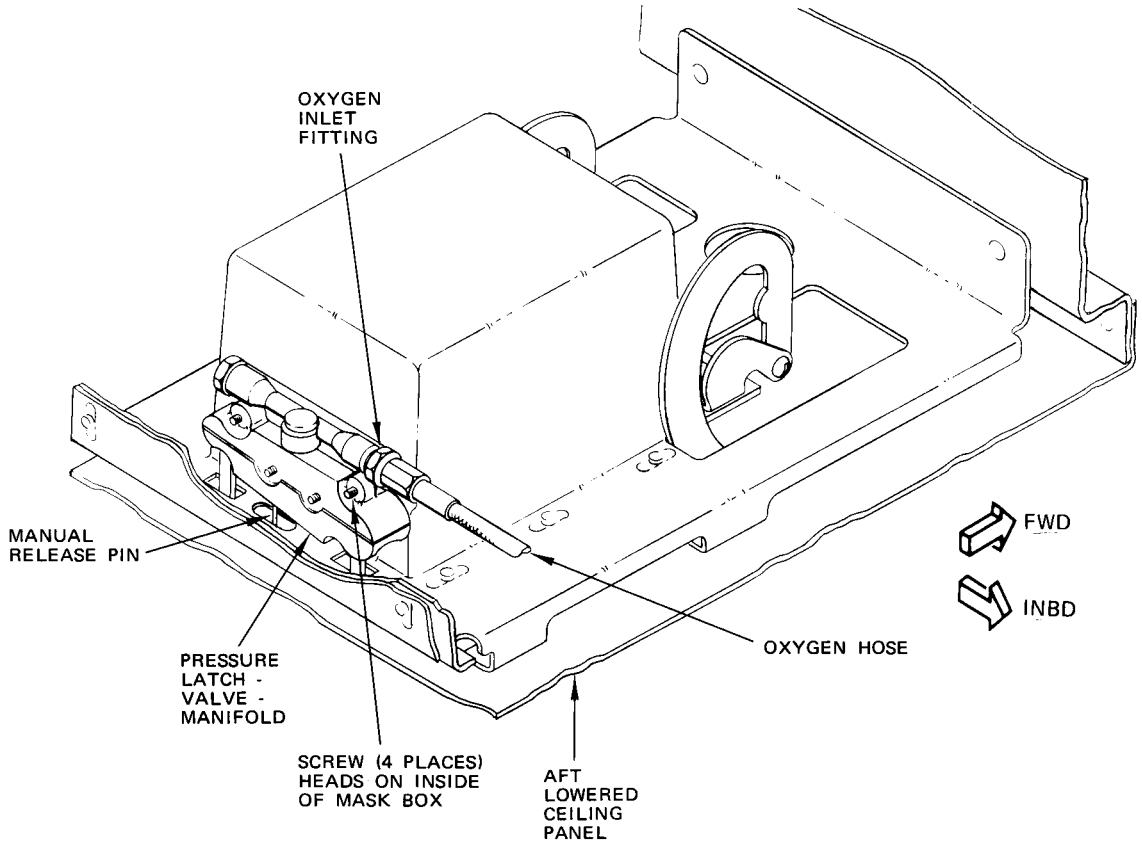
   D. From inside of oxygen mask box remove screws attaching latch-valve-manifold assembly to box.
   E. Remove latch-valve-manifold assembly.
5. Install Pressure Latch-Valve-Manifold Assembly
   A. Position latch-valve-manifold assembly on oxygen mask box and loosely install screws.
   B. Gently close oxygen mask box door and insure it aligns properly with passenger service unit.
   C. Hold door in this position and tighten screws.

      CAUTION: AVOID EXCESSIVE TIGHTENING OF SCREWS, WHICH MAY CAUSE BINDING OR STICKING OF LATCH.

   D. Check operation of door by opening and closing several times.



ALTERNATIVE AFT ATTENDANT'S SERVICE UNIT LOCATIONS



Pressure Latch Valve - Manifold Installation Aft
Figure 401

E. Connect flexible supply hose to latch-valve-manifold assembly.

NOTE: Hold oxygen inlet fitting with a wrench when connecting oxygen line to prevent fitting from being loosened from manifold.

F. Install masks (Ref Aft Attendants' Service Unit Oxygen Masks, Removal/Installation).
G. Test connection for leaks using leak detection compound (Ref 35-21-0, Adjustment/Test).

6. Restore Airplane to Normal Configuration
   A. Install lowered ceiling panel (Ref Chapter 25, Lowered Ceilings - Removal/Installation).
   B. Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

LAVATORY SERVICE UNIT PRESSURE LATCH-VALVE-MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. General
   A. The lavatory service unit is attached to the lavatory ceiling panel. The service unit must be removed for access to the latch assembly.
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00, Maintenance Practices.
2. Equipment and Materials
   A. Oxygen system leak detection compound (Ref Chapter 20, Miscellaneous Materials)
3. Prepare to Remove Pressure Latch-Valve-Manifold Assembly
   A. Close passenger oxygen cylinders shutoff valve(s).
   B. Actuate release pin to open oxygen service unit door. Masks will drop.
   C. Remove attaching screws to each side of service unit and lower service unit (Fig. 401).

      NOTE: Hinge extends beyond forward edge of service unit.

      CAUTION: OBSERVE CARE TO AVOID DAMAGING CEILING PANEL.

4. Remove Pressure Latch-Valve -Manifold Assembly
   A. Disconnect mask hoses from nozzle.
   B. Remove flow control pins and remove mask assemblies.
   C. Disconnect nut attaching flexible supply hose to pressure latch-valve-manifold assembly.

      NOTE: Hold oxygen inlet fitting with a wrench when disconnecting oxygen line to prevent fitting from being loosened from manifold.

      CAUTION: DO NOT TWIST, KINK, OR PINCH HOSES.

   D. From inside of oxygen mask box remove screws attaching latch-valve-manifold assembly to box.
   E. Remove latch-valve-manifold assembly.
5. Install Pressure Latch-Valve-Manifold Assembly
   A. Position latch-valve-manifold assembly on oxygen mask box and loosely install screws.
   B. Install service unit.
   C. Gently close oxygen mask box door and insure it aligns properly with passenger service unit.

D. Hold door in this position and tighten screws.

CAUTION: AVOID EXCESSIVE TIGHTENING OF SCREWS, WHICH MAY CAUSE BINDING OR STICKING OF LATCH.

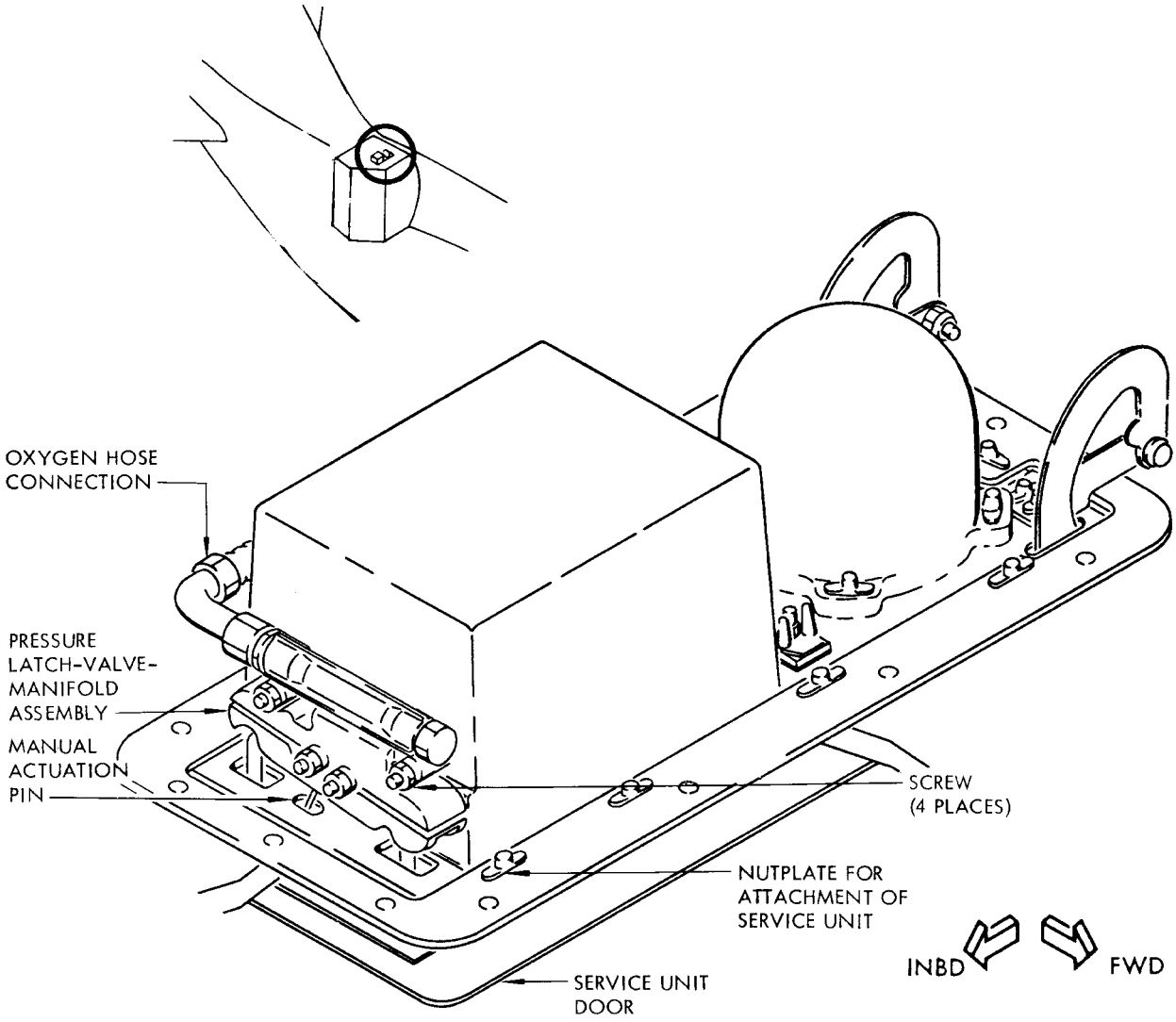
E. Check operation of door by opening and closing several times
F. Connect flexible supply hose to latch-valve-manifold assembly.

NOTE: Hold oxygen inlet fitting with a wrench when connecting oxygen line to prevent fitting from being loosened from manifold.

G. Install masks (Ref Lavatory Service Unit Oxygen Masks - Removal/Installation).
H. Test connection for leaks using leak detection compound (Ref 35-21-0, Adjustment/Test).

6. Restore Airplane to Normal Configuration
   A. Install service unit with screws.
   B. Slowly open passenger oxygen cylinder shutoff valve(s).

WARNING: VALVE(S) MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.



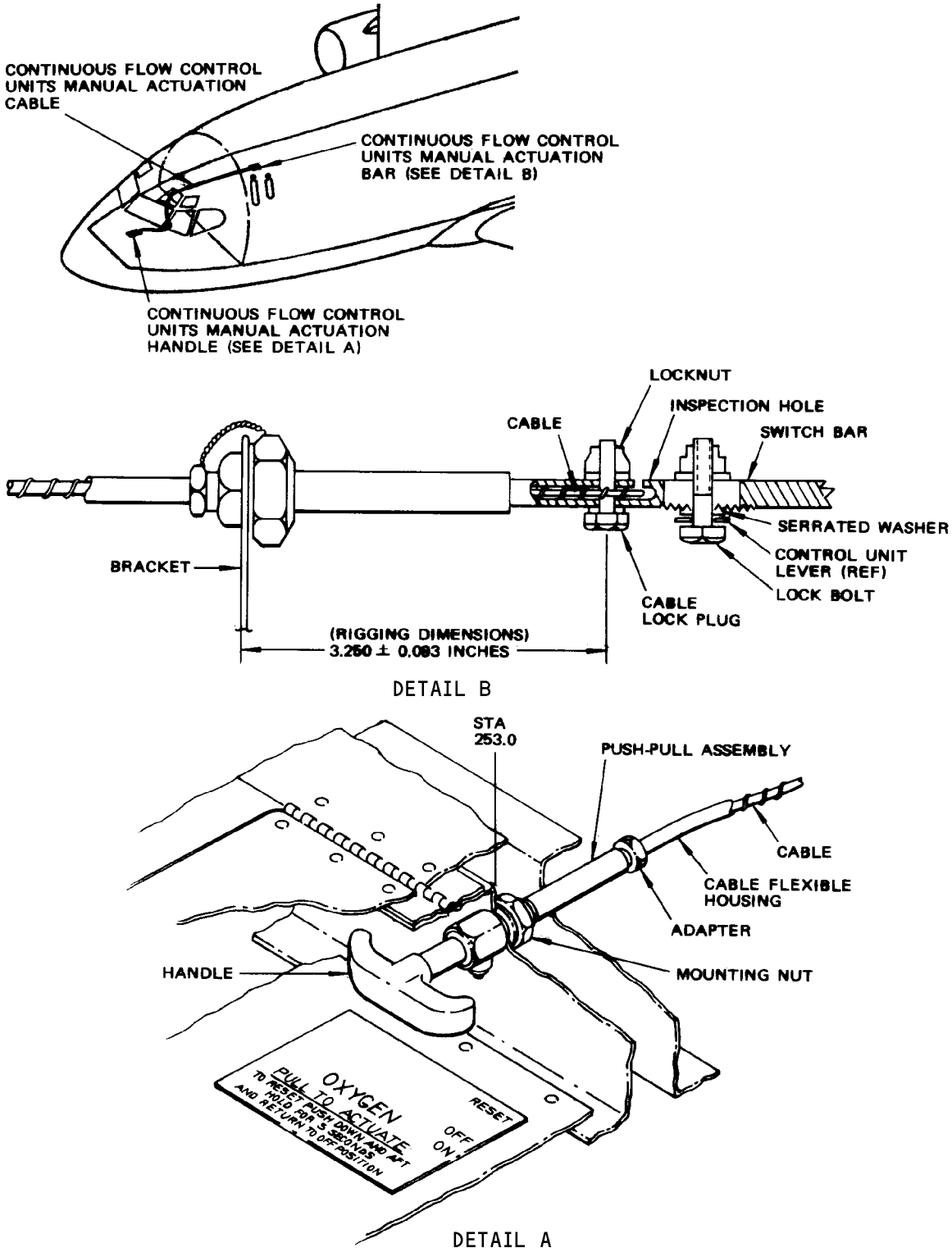
Lavatory Service Unit Installation (Typical)
Figure 401

PASSENGER OXYGEN CONTINUOUS FLOW CONTROL UNITS MANUAL ACTUATION CABLE - REMOVAL/INSTALLATION

1. General
   A. The continuous flow control units manual actuation cable consists of a handle, cable, flexible cable housing, and switch bar. The handle is located below an access door in the control cabin floor, aft, and to the left of the control stand at station 252. The handle has three positions: ON, OFF, and RESET, and is connected to a cable. The cable is in a flexible housing and connected to the switch bar.
   B. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-00 Maintenance Practices.
2. Remove Manual Actuation Cable (See figure 401.)
   A. Disconnect switch bar from continuous flow control unit levers by removing lockbolt and serrated washer.
   B. Loosen locknut on cable lock plug.
   C. Remove switch bar from cavity of bulkhead connector by rotating switch bar clockwise until cable clears cable lock plug.
   D. Disconnect push-pull assembly from flexible housing by unscrewing adapter from push-pull assembly and removing mounting nut.
   E. Remove handle, push-pull assembly, and cable assembled from flexible housing.
3. Install Manual Actuation Cable (See figure 401.)
   A. Insert cable into flexible housing.
   B. Position push-pull assembly and secure with mounting nut.
   C. Attach cable housing adapter to push-pull assembly.
   D. Align index mark on head of cable lock plug parallel with longitudinal axis of switch bar.
   E. With handle in OFF position, insert cable into hole in end of switch bar; then switch bar into bulkhead connector.
   F. When end of cable bottoms against cable lock plug, rotate switch bar counterclockwise until cable is visible in inspection hole.
   G. Adjust switch bar to cable to attain rigging dimension specified in figure 401.
   H. Tighten locknut on cable lock plug.

      NOTE: Cable must be visible through inspection hole before securing cable lock plug. If cable is not visible through inspection hole, cable may not be engaging cable lock plug.

   I. Connect switch bar to continuous flow control unit levers.



Passenger Oxygen Continuous Flow Control Units
Figure 401

J. Adjust levers of continuous flow control units to switch bar using the lockbolt and serrated washer for adjustment to desired location. Refer to 35-21-21, Passenger Oxygen Continuous Flow Control Unit - Removal/Installation.

NOTE: Each lever should barely touch the plunger on each control unit.

K. To check operation of cable, test passenger oxygen system operation with manual operation. Refer to 35-21-0, Passenger Oxygen System - Adjustment/Test.

NOTE: During test of system operation, masks may be prevented from falling by loosely fastening each service unit door to prevent full opening.

PORTABLE OXYGEN EQUIPMENT - DESCRIPTION AND OPERATION

1. General

A. First aid and sustaining portable oxygen cylinder assemblies are mounted at convenient locations distributed throughout the airplane (Fig. 1).

B. Each passenger cabin portable oxygen cylinder assemblies consist of the following parts: high pressure oxygen cylinder, constant flow pressure regulator, ON-OFF valve, relief valve, safety plug, charging valve, outlet assemblies, and pressure gage. The control cabin cylinder assembly consists of the same parts, plus a demand-type oxygen regulator. A demand-type mask can be attached to this regulator (Fig. 2).

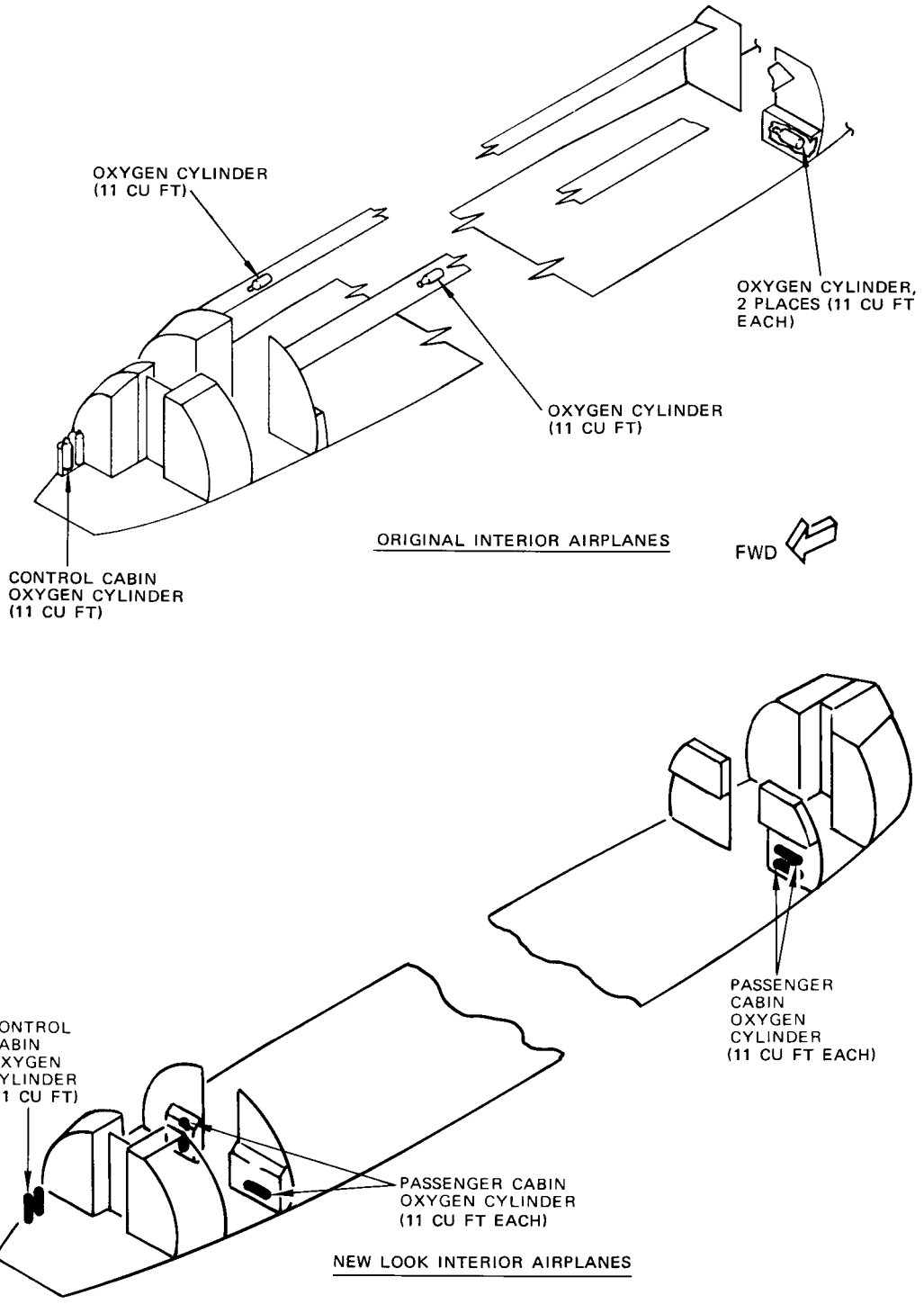
C. The pressure gage indicates oxygen pressure in the cylinder and thereby the quantity of oxygen available. Cylinder pressure should be 1800 psig at 70°F. The safety plug contains a fusible alloy which melts in case of excessive heat allowing the cylinder to vent into the atmosphere. The ON-OFF valve controls flow of high pressure oxygen into the pressure regulator.

D. The pressure regulator consists of a pressure reducing mechanism which reduces oxygen to a pressure suitable to supply to the outlet assembly or the demand regulator. The pressure regulator also carries a recharging valve assembly which permits refilling the cylinder.

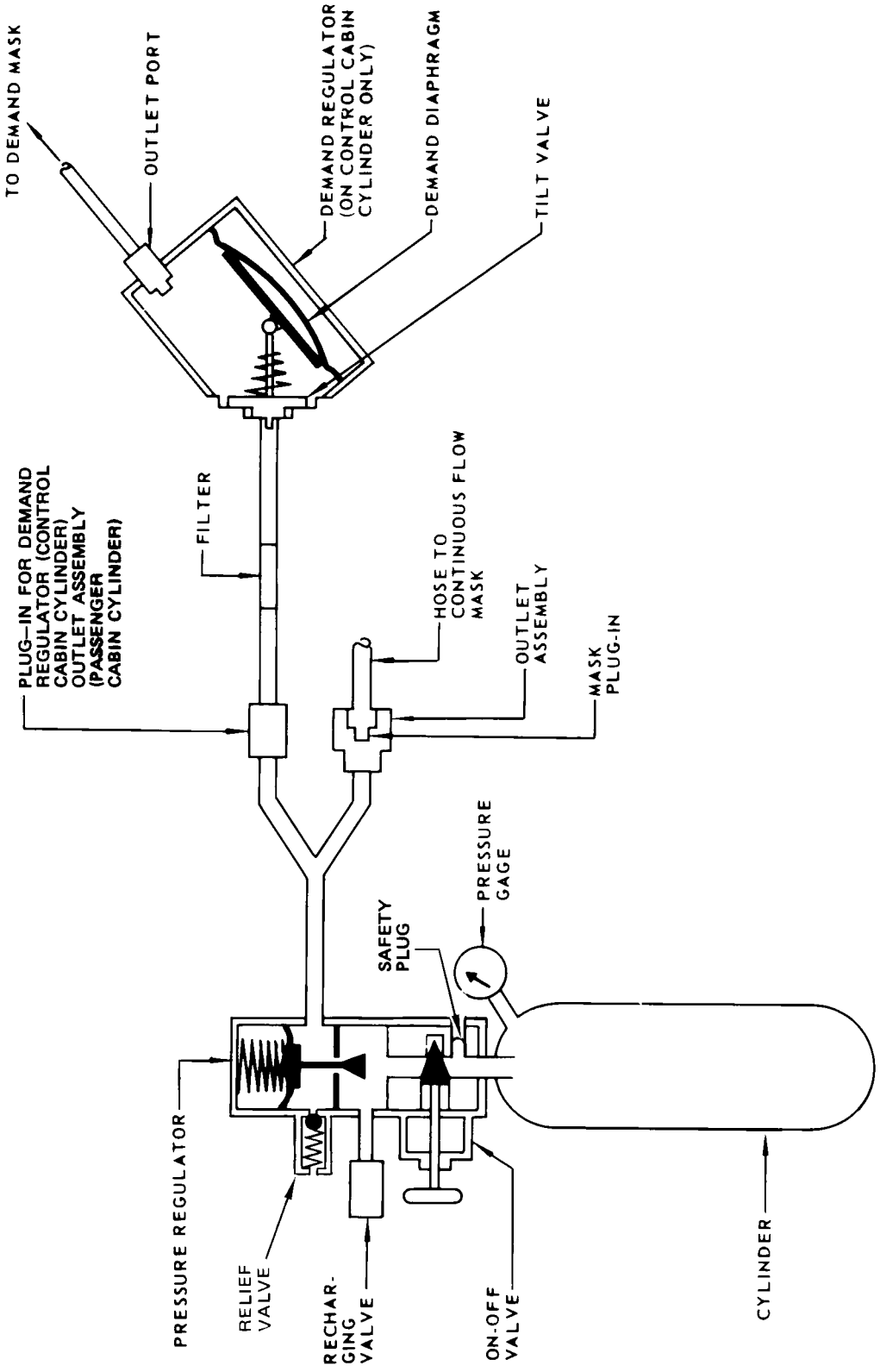
E. Outlet assemblies are connected directly to the constant flow pressure regulator. There are two on each passenger cabin cylinder and one on the control cabin cylinder. Each outlet assembly contains an internal check valve, a flow metering device and an oxygen hose plug-in adapter. When a plug-in is inserted, it opens the check valve and allows flow into a mask, provided the cylinder ON-OFF valve is open. The two outlet assemblies on each passenger cabin cylinder are rated one at 2 liters per minute (LPM) and the other at 4 LPM. The outlet assembly on the control cabin cylinder is rated at 3 LPM.

F. The control cabin cylinder demand regulator consists of a tilt valve, a diaphragm and a connection for a demand-type mask.

G. An oxygen mask with an attached hose is secured to each portable oxygen cylinder assembly. For use, the hose has to be connected to the oxygen outlet on the cylinder



Portable Oxygen Cylinders Location
Figure 1



Portable Oxygen Equipment Schematic
Figure 2

PORTABLE OXYGEN CYLINDERS - ADJUSTMENT/TEST

1. Portable Oxygen Cylinder Adjustment
   A. General
      (1) Do not attempt to adjust a unit in the field. Return unit to a qualified overhaul depot if it fails to operate in the manner prescribed.
2. Portable Oxygen Cylinder Test
   A. Turn the knob a minimum of one-half turn to open the ON-OFF valve.
   B. Put a mask hose fitting in each of the outlet assemblies.
   C. Use a flowmeter to measure the flow of each outlet assembly.
   D. Set the flow of the ground level outlet assembly to the specified range (Table 1) to get the flow setting for the indicated altitude.

      NOTE: Each of the outlet assemblies has a code for the flow and altitude setting. The first number is the flow in liters per minute, and the second number is the altitude. If the outlet assembly does not have a code, or you cannot read the code, use the basic equipment part number to find the flow and altitude setting (Fig. 501).

Table 1						
Required Altitude Flow in standard liters/minute (760 mm Hg, 32°F)	ALTITUDE - FEET X 1000					
	5	10	15	20	25	30
	Required ground level (760 mm Hg) flow setting in standard liters/minute					
0.5	0.74	0.86	0.91	0.96	1.00	1.08
2.0	2.51	2.65	2.72	2.80	2.84	2.89
2.5	3.07	3.21	3.30	3.40	3.44	3.47
2.7	3.37	3.48	3.58	3.65	3.72	3.78
3.0	3.72	3.85	3.97	4.08	4.14	4.22
4.0	4.83	4.98	5.10	5.21	5.30	5.38
7.0	8.40	8.52	8.71	8.81	8.91	9.02
8.0	9.58	9.71	9.92	10.02	10.12	10.25

5500-A1A-C5A

Multiply this number by 1000 to get the altitude in feet

Constant Flow Outlet Setting in Standard Liters per Minute at Indicated Altitude

Letter	Flow
A	0.5
B	2.0
C	2.5
D	2.7
E	3.0
F	4.0
G	7.0
H	8.0

Outlet Assembly Flow and Altitude Setting from the Basic Cylinder Part Number for Portable Oxygen Cylinder
Figure 501

PORTABLE OXYGEN EQUIPMENT - INSPECTION/CHECK

1. Portable Oxygen Cylinder Check
   A. Equipment and Materials
      (1) G00091 Oxygen System Leak Detection Compound (Ref 20-30-51)
   B. Access
      (1) Location Zone
            100 Upper Half of the Fuselage
   C. Do a check of the Portable Oxygen Cylinder.
      (1) Make sure that the oxygen cylinder hydrostatic test date complies with current regulations.

          Note: The hydrostatic test date must be within the perscribed service life limit. The service life of the hydrostatic test is established by national regulatory authorities, the cylinder manufacturer, and/or the airline.

          NOTE: The last hydrostatic test date will be stamped on the neck of the oxygen cylinder.

      (2) Do a check of the pressure on the pressure gage.
          (a) Make sure the oxygen cylinder gage pressure is not more than 1850 psi at 70°F (21°C).
          (b) Replace the portable oxygen cylinder, if the gage pressure is greater than the maximum pressure set for the airline or national regulatory authority.
          (c) Replace the portable oxygen cylinder, if the gage pressure is less than the minimum pressure set for the airline or national regulatory authority.
      (3) Turn the knob on the ON-OFF valve a minimum of one-half turn and open the ON-OFF valve.
      (4) Apply the leak detection compound to all the fittings and connections.

          NOTE: Bubbles will show there are leaks that you must repair.

      (5) Torque the fitting connections to repair the leakage (AMM 20-50-11).
      (6) If the leakage continues, send the portable oxygen cylinder to an approved overhaul shop.

          NOTE: Leakage is not permitted.

PORTABLE OXYGEN EQUIPMENT - CLEANING/PAINTING

1. Portable Oxygen Cylinders Cleaning
   A. Clean the outside of the unit with a dry cloth. Touch up may be accomplished in accordance with standard practice.

      CAUTION: ALL PORTS MUST BE MASKED OR PLUGGED TO PREVENT THE ENTRANCE OF FOREIGN MATERIAL INTO THE UNIT.