HEATER OVERHEAT WARNING LIGHT

An amber overheat warning light provided in the annunciator panel is labeled HEATER OVHT, see Figure 7-3. When illuminated, the light indicates that the heater overheat switch has been actuated and that the temperature of the air in the heater has exceeded 163oC (325oF). Once the heater overheat switch has been actuated, the heater turns off and cannot be restarted until the overheat switch, located in the right forward nose compartment, has been reset. Prior to having the overheat switch reset, the heater should be thoroughly checked to determine the reason for the malfunction.

HEATER OPERATION FOR HEATING AND DEFROSTING

(1) Battery Switch - ON.
(2) Pressurization Air Controls - PUSH IN.
(3) Ram Dump Control - PUSH IN.
(4) Cabin Air Knobs - PULL OUT.
(5) Defrost Knob - Adjust as desired (if defrosting is desired).
(6) Cabin Heat Knob - MAX or as desired.
(7) Pressurization Air Temperature Controls - CLOCKWISE.
(8) Cabin Heat Switch - ON.

NOTE

- If warm air is not felt coming out of the registers within one minute, turn cabin heat switch OFF; check circuit breaker and try another start. If heater still does not start, no further starting attempt should be made.
- During heater operation, defrost and/or cabin air knobs must be out.

HEATER USED FOR VENTILATION

(1) Battery Switch - ON.
(2) Cabin Air Knobs - PULL OUT as desired.
(3) Cabin Fan Switch - NORMAL or HIGH as desired.

CABIN PRESSURIZATION SYSTEM

OPERATING DETAILS

The airplane may be operated in either the pressurized mode or depressurized mode. The mode selection is made with the cabin pressurization switch and/or the ram dump control, see Figure 7-27 or 7-29. Mode of operation should be selected prior to takeoff. If a mode selection must be made while airborne, the ram dump control should be moved very slowly to minimize pressure transients which would cause discomfort to the passengers.

HEATER OVERHEAT WARNING LIGHT

An amber overheat warning light provided in the annunciator panel is labeled HEATER OVHT, see Figure 7-3. When illuminated, the light indicates that the heater overheat switch has been actuated and that the temperature of the air in the heater has exceeded 163oC (325oF). Once the heater overheat switch has been actuated, the heater turns off and cannot be restarted until the overheat switch, located in the right forward nose compartment, has been reset. Prior to having the overheat switch reset, the heater should be thoroughly checked to determine the reason for the malfunction.

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(3) Ram Dump Control - PUSH IN.
(4) Cabin Air Knobs - PULL OUT.
(5) Defrost Knob - Adjust as desired (if defrosting is desired).
(6) Cabin Heat Knob - MAX or as desired.
(7) Pressurization Air Temperature Controls - CLOCKWISE.
(8) Cabin Heat Switch - ON.

NOTE

- If warm air is not felt coming out of the registers within one minute, turn cabin heat switch OFF; check circuit breaker and try another start. If heater still does not start, no further starting attempt should be made.
- During heater operation, defrost and/or cabin air knobs must be out.

HEATER USED FOR VENTILATION

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(2) Cabin Air Knobs - PULL OUT as desired.
(3) Cabin Fan Switch - NORMAL or HIGH as desired.

CABIN PRESSURIZATION SYSTEM

OPERATING DETAILS

The airplane may be operated in either the pressurized mode or depressurized mode. The mode selection is made with the cabin pressurization switch and/or the ram dump control, see Figure 7-27 or 7-29. Mode of operation should be selected prior to takeoff. If a mode selection must be made while airborne, the ram dump control should be moved very slowly to minimize pressure transients which would cause discomfort to the passengers.

CABIN AIR SYSTEM SCHEMATIC
DEPRESSURIZED MODE, HEATER ON

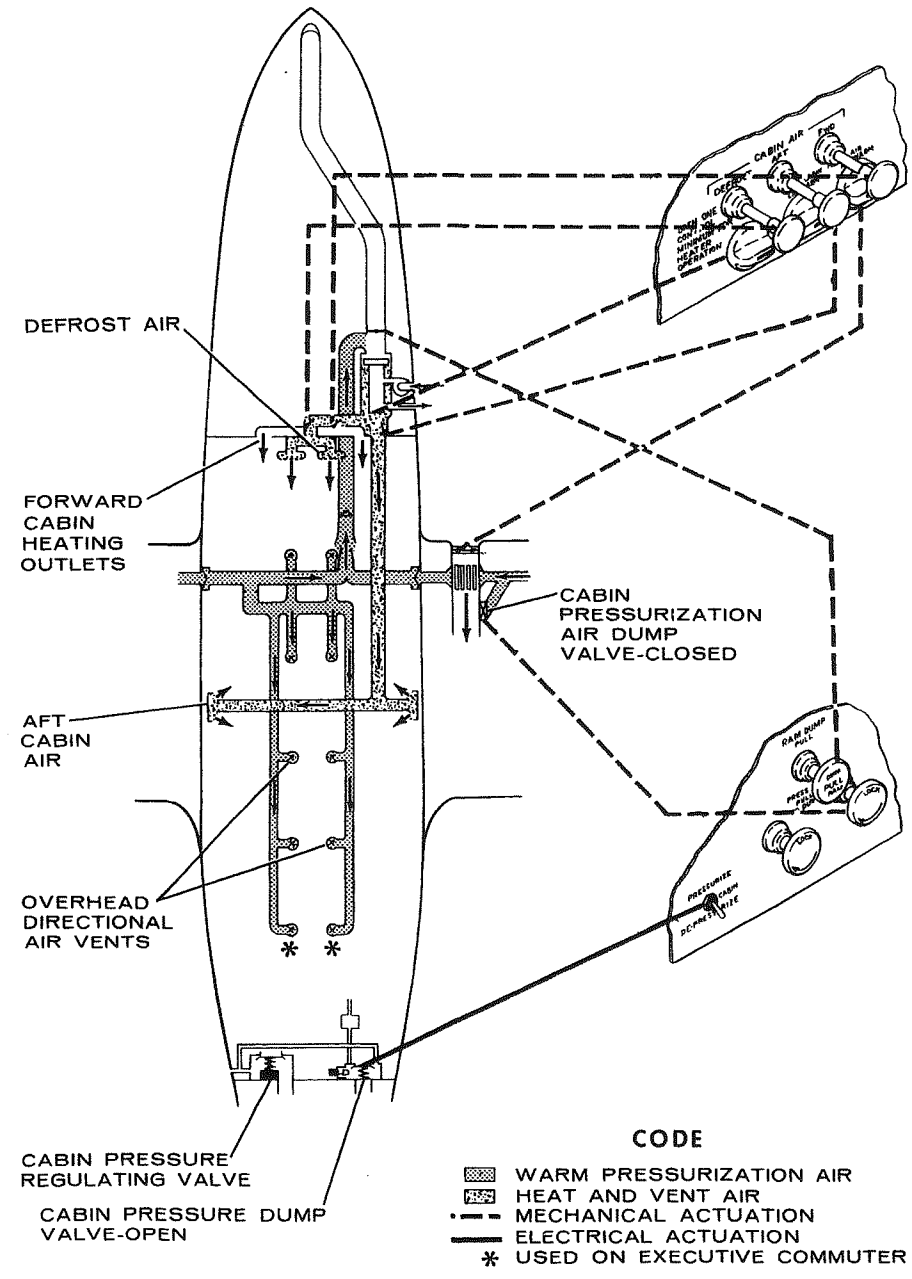


Figure 7-25

Pressurization air is supplied from each engine turbocharger through the sonic venturi (flow limiter), the heat exchanger and then into the cabin. Adequate flow to maintain pressurization is provided by either engine at normal power settings. Power changes should be made smoothly to prevent sudden changes in pressurization air inflow resulting in cabin pressure transients.

The pressurization controls and indicators of your airplane, see Figure 7-27 (standard system) or 7-29 (optional system), consist of right and left pressurization air controls, a ram dump control, a cabin pressurization switch, a cabin rate-of-climb indicator and a combination cabin altimeter and differential pressure indicator.

A warning light, which illuminates at approximately 10,000 feet cabin altitude indicating a need for oxygen, is located in the annunciator panel.

To optimize normal operation in the pressurized mode, position the pressurization controls as follows:

(1) Pressurization Air Controls - PUSH IN for all flight operations and ground operation when additional ground ventilation is desired.

(2) Ram Dump Control - PUSH IN for all flight operations and normal ground operation.
- PULL OUT for additional ground ventilation.

(3) Cabin Pressurization Switch - PRESSURIZE.

To optimize normal operation in the depressurized mode, position the pressurization controls as follows:

(1) Pressurization Air Controls - PUSH IN if heater operation or additional ground ventilation is desired.
- PULL OUT if heater operation is not desired.

(2) Ram Dump Control - PUSH IN if in-flight heater operation is desired.
- PULL OUT if additional ground ventilation is desired.

(3) Cabin Pressurization Switch - DEPRESSURIZE.

STANDARD PRESSURIZATION SYSTEM

The PRESSURIZE position of the cabin pressurization switch, see Figure 7-26, provides for cabin pressurization at altitudes above 8000 feet. The cabin altitude is maintained at 8000 feet at all airplane altitudes between 8000 and 23,120 feet. From 23,120 feet to the operating ceiling of 30,000 feet, 5.0 PSI differential is maintained between cabin and atmosphere.

Until reaching 8000 feet, the cabin rate-of-climb, see Figure 7-27, will be equal to the airplane rate-of-climb. At 8000 feet, the cabin rate-of-climb will drop to zero as pressurization begins. The cabin rate-of-climb will remain approximately at this indication until the airplane has reached an altitude of 23,120 feet. Above this altitude, the cabin altitude will again begin to ascend as the airplane ascends, but at a lesser rate than the airplane rate-of-climb because of the difference in ambient air density and cabin air density. The cabin altitude reaches approximately 10,000 feet at an airplane altitude of 26,500 feet; at this time the altitude warning light on the annunciator panel will illuminate, indicating the need for oxygen.

CABIN AIR SYSTEM SCHEMATIC
PRESSURIZED MODE, HEATER ON

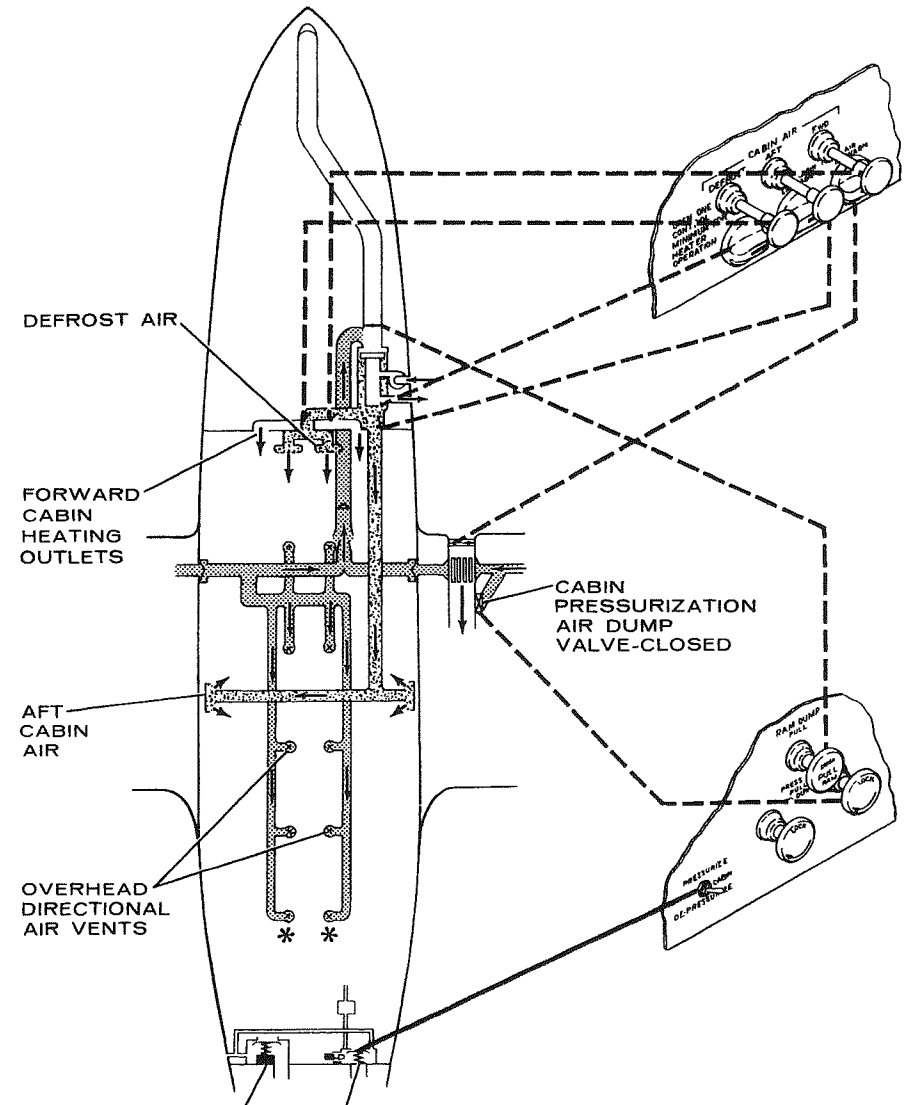


Figure 7-26

STANDARD PRESSURIZATION CONTROLS AND INDICATORS

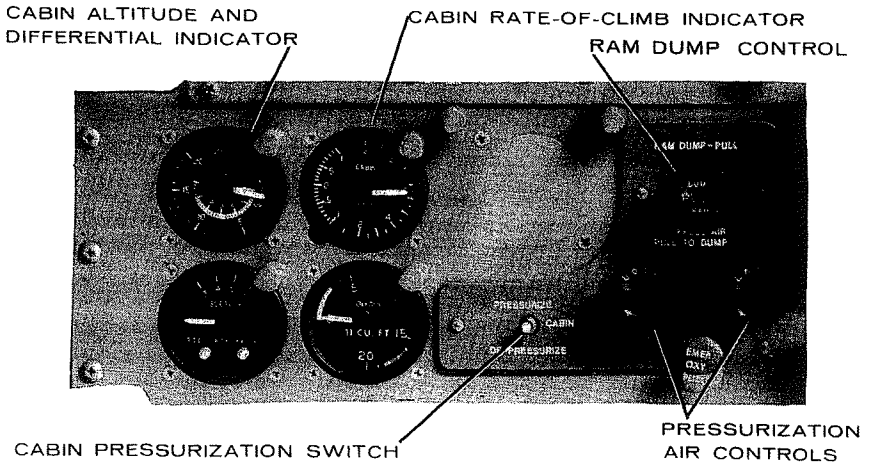


Figure 7-27

The cabin differential pressure of 5.0 PSI is limited by the pressure regulator valve, see Figure 7-26, located in the aft portion of the cabin. This valve automatically permits air to leave the cabin to maintain the desired pressure. If the regulating valve should fail in the closed position, a dump valve, see Figure 7-26, also located in the aft portion of the cabin, operates as a safety valve to regulate maximum cabin differential pressure at 5.3 PSI. This is a dual function valve which functions as a cabin dump when the DEPRESSURIZE position is selected with the cabin pressurization switch.

The cabin altitude which is maintained at a given airplane altitude is shown in Figure 7-28.

STANDARD PRESSURIZATION SCHEDULE

AIRPLANE ALTITUDE	CABIN ALTITUDE
SEA LEVEL TO 8000 FEET	SAME AS AIRPLANE ALTITUDE
8000 to 23,120 FEET	8000 FEET
24,790 FEET	9000 FEET
26,500 FEET	10,000 FEET
28,260 FEET	11,000 FEET
30,000 FEET	11,950 FEET

Figure 7-28

The aft cabin dump valve is used during ground operation to assure the cabin pressure differential is zero. The dump valve is opened automatically by the landing gear safety switch when the weight of the airplane is on the landing gear or can be opened manually by selecting the DEPRESSURIZE position of the cabin pressurization switch. Normally, the cabin pressurization switch can be left in the PRESSURIZE position. However, should a malfunction occur or if a landing is attempted above 8000 feet pressure altitude, select the DEPRESSURIZE position. This airplane is not certified for landings with the cabin pressurized.

NOTE

The airplane cannot be pressurized on the ground as the landing gear safety switch circuit is interconnected with the aft cabin dump valve circuit.

In the event that an emergency should require immediate depressurization, place the cabin pressurization switch in the DEPRESSURIZE position, see Figure 7-25, and pull out the cabin vent control. These actions electrically open the aft cabin dump valve and mechanically open the ram air inlet butterfly valve located in the nose; however, pressurization air will still flow into the cabin.

OPTIONAL PRESSURIZATION SYSTEM

For the pressurization system to operate, the cabin pressurization switch must be in the PRESSURIZE position and the cabin vent control and pressurization air controls must be pushed in, see Figure 7-29. The desired cabin altitude and cabin rate-of-climb can then be selected on the cabin pressure rate controller, see Figure 7-29. The selected values can be maintained until a cabin altitude is reached which results in a 5.0 PSI differential between cabin and atmosphere.

The cabin rate control is located adjacent to the pilot's control wheel. To obtain optimum benefit from the rate control, it is necessary to set in field pressure altitude plus 500 feet on the outer CABIN ALT scale just prior to takeoff with the rate control arrow positioned straight up. After

OPTIONAL PRESSURIZATION CONTROLS AND INDICATORS

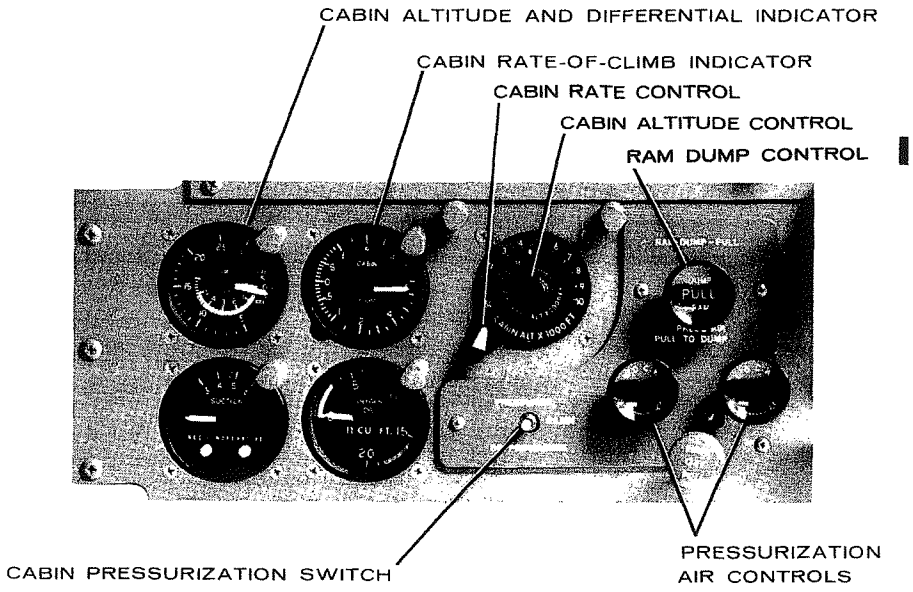


Figure 7-29

takeoff, with the cabin pressure stabilized, slowly reset the cabin altitude control to cruise altitude plus 500 feet on the inner AIRCRAFT ALT scale or destination field pressure altitude plus 500 feet on the outer CABIN ALT scale. Make the selection which will provide the highest cabin altitude. For cruising altitudes below the inner scale values, always select the destination field pressure altitude plus 500 feet on the outer scale. The selection should be made slowly to provide maximum comfort. Adjust the cabin rate control as the climb progresses such that the selected cabin altitude is reached at approximately the same time the airplane reaches cruising altitude.

The above procedure is recommended because once the engines have been started and a source of vacuum is available, the pressure control system will begin to "climb" to the preset cabin altitude; thus, if cabin altitude required for cruise is selected too soon, the pressure control system will have climbed to an altitude approaching the desired cabin altitude before the airplane leaves the ground. Since the cabin pressure can never be less than outside ambient pressure, the cabin will be unpressurized until the airplane "catches up" with the pressure control system or the desired cabin altitude is reached, whichever occurs first. This will result in no cabin rate control being available as the cabin rate-of-climb will be equal to the airplane rate-of-climb.

The cabin differential pressure of 5.0 PSI is limited by the pressure regulator valve, see Figure 7-26, located in the aft portion of the cabin. This valve automatically permits air to leave the cabin to maintain the

desired pressure. If the regulating valve should fail in the closed position, a dump valve, see Figure 7-26, also located in the aft portion of the cabin, operates as a safety valve to regulate maximum cabin differential pressure to 5.3 PSI. This is a dual function valve which also functions as a cabin dump when the DEPRESSURIZE position is selected with the cabin pressurization switch.

OPTIONAL PRESSURIZATION SCHEDULE

AIRPLANE ALTITUDE	CABIN ALTITUDE
SEA LEVEL TO 11,060 FEET	SEA LEVEL
13,910 FEET	2000 FEET
16,850 FEET	4000 FEET
19,920 FEET	6000 FEET
23,120 FEET	8000 FEET
26,500 FEET	10,000 FEET
30,000 FEET	11,950 FEET

Figure 7-30

The aft cabin dump valve is used during ground operation to assure the cabin pressure differential is zero. The dump valve is opened automatically by the landing gear safety switch when the weight of the airplane is on the landing gear or can be opened manually by selecting the DEPRESSURIZE position of the cabin pressurization switch. Normally, the cabin pressurization switch can be left in the PRESSURIZE position. However, should a malfunction occur or if the cabin altitude is inadvertently set at a lower altitude than field pressure altitude, select the DEPRESSURIZE position. It is important, therefore, to select a cabin altitude approximately 500 feet above field pressure altitude and check cabin pressure differential at zero prior to landing. This will prevent any cabin pressure transients on landing and provide maximum passenger comfort.

NOTE

The airplane cannot be pressurized on the ground as the landing gear squat switch circuit is interconnected with the aft cabin dump valve circuit.

The lowest cabin altitude which can be maintained at any given airplane altitude is shown in the chart in Figure 7-30.

OXYGEN SYSTEM

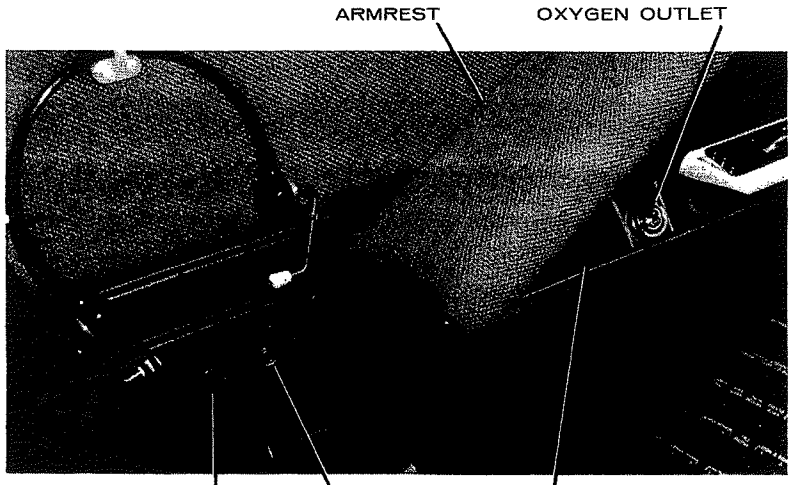
The oxygen system provides individual service for the pilot, copilot and each passenger. The oxygen supply is stored in either an 11.0 or 114.9 cubic foot bottle located in the nose compartment. Cabin plumbing, including outlets for each occupant, is standard with each airplane and will vary with individual airplane seating configuration. The oxygen control, pressure gage (see Figure 7-1), bottle, regulator and nose compartment plumbing are optional.

The oxygen system is activated by pulling the oxygen control knob, see Figure 7-1, to the ON position, allowing oxygen to flow from the regulator to all cabin outlets. A normally closed valve in each oxygen outlet is opened by inserting the connector of the mask and hose assembly. After flights using oxygen, the pilot should insure that the oxygen system has been deactivated by unplugging all masks and pushing the oxygen control knob completely to the OFF position.

NOTE

If the oxygen control knob is left in an intermediate position between ON and OFF, it may allow low pressure oxygen to bleed through the regulator into the nose compartment of the airplane.

COCKPIT OXYGEN OUTLETS



PILOT'S SIDE SHOWN; IDENTICAL CONTROLS ARE PROVIDED FOR THE COPILOT.

Figure 7-31

The oxygen system with optional 114.9 cubic foot oxygen bottle provides adequate oxygen flow rates up to 30,000 feet cabin altitude and is suitable for cruising at altitudes in excess of 25,000 feet for extended periods, see Figure 7-32. The oxygen outlets for the pilot and copilot are located inside the stowage compartment under the outboard armrests, see Figure 7-31. Oxygen outlets for passengers are located overhead of each seat position, see Figure 7-21. The pilot, copilot and passengers shall always use the blue hose assemblies.

OXYGEN DURATION CHART

114.9 CUBIC FOOT OXYGEN SYSTEM

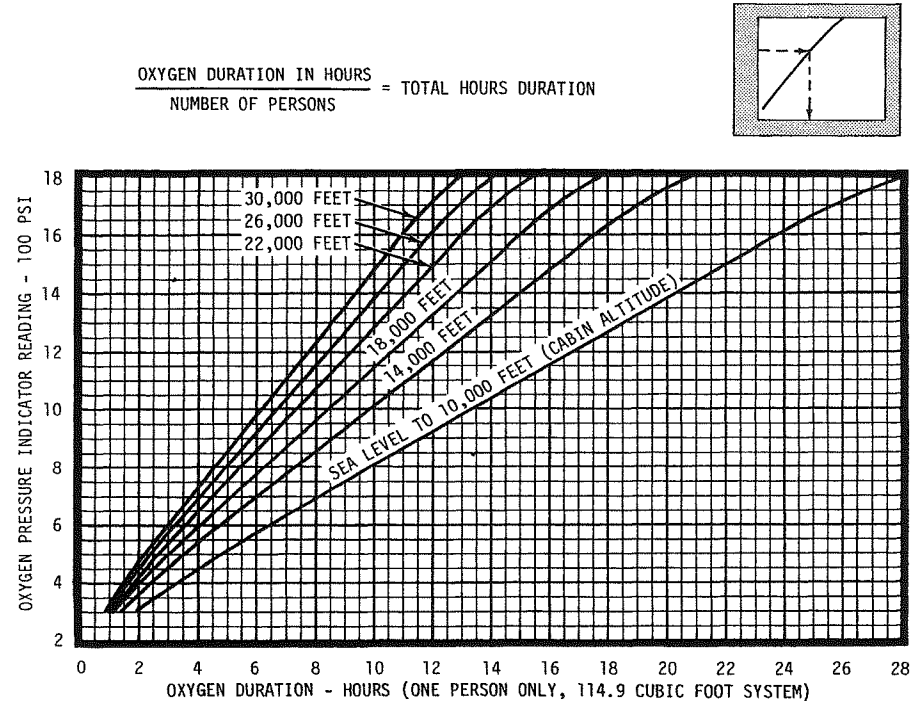


Figure 7-32

The oxygen system with optional 11.0 cubic foot bottle provides adequate oxygen flow rates up to 30,000 feet cabin altitude, see Figure 7-33. This system is designed solely to provide for emergency descents as described in Section 3. The system is calibrated for two different altitude ranges, which are: 10,000 to 22,000 feet cabin altitude and 22,000 to 30,000 feet cabin altitude. Selection of the desired altitude range is accomplished by appropriate selection of color-coded hose assemblies. The oxygen outlets for the pilot and copilot are located inside the stowage compartment under the outboard armrests, see Figure 7-31. Oxygen outlets for passengers are located overhead of each seat position, see Figure 7-21. The pilot shall always use the red hose assembly.

NOTE

Some airplanes are delivered with red oxygen hose mask connectors only. If your airplane is so equipped, disregard all information pertaining to orange oxygen hose mask connectors.

OXYGEN CONSUMPTION RATE TABLE

11.0 CUBIC FOOT OXYGEN SYSTEM

OXYGEN DURATION CALCULATION:

TOTAL OXYGEN DURATION (HOURS) = OXYGEN PRESSURE INDICATOR READING ÷ [OXYGEN CONSUMPTION (PSI/HR) × NUMBER OF PASSENGERS + PILOT CONSUMPTION RATE].

CABIN ALTITUDE RANGE-FEET	HOSE ASSEMBLY COLOR	CONSUMPTION PSI/HR
10,000 22,000	ORANGE	965
22,000 30,000	RED	1352

Figure 7-33