NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

AIRWORTHINESS GROUP CHAIRMAN'S FACTUAL REPORT
ATTACHMENT II: Configuration Drawings, Learjet Model 35

(40 Pages)

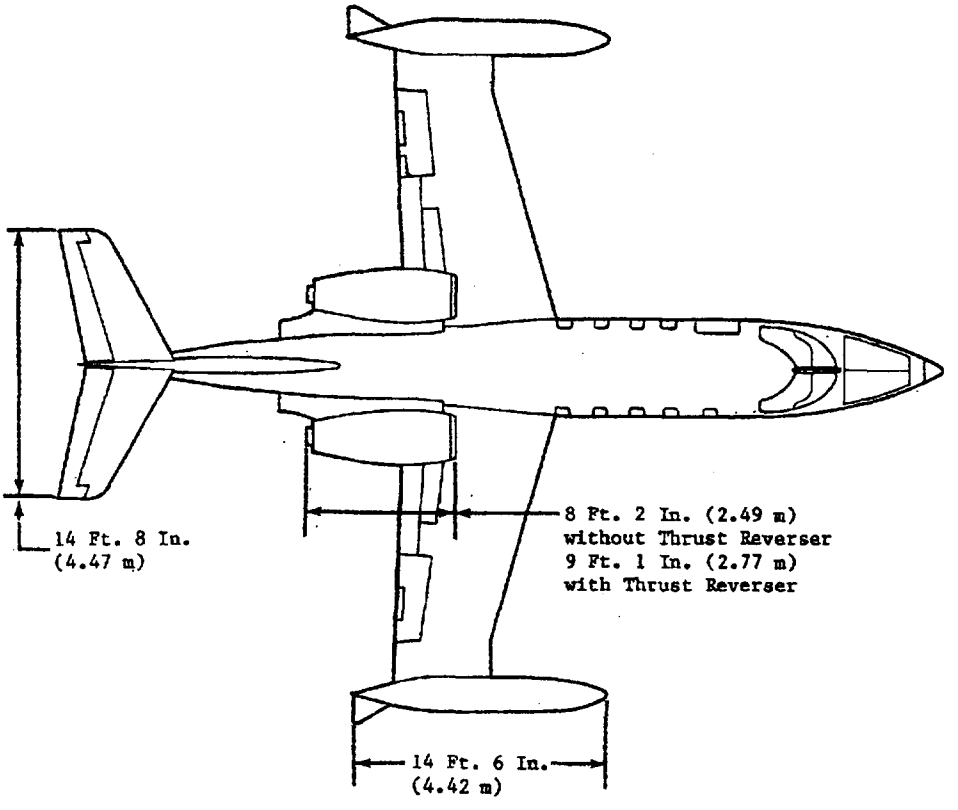
Sunjet Aviation, Inc.
Mina, South Dakota
October 25, 1999

DCA00MA005

Learjet

GENERAL - DESCRIPTION AND OPERATION

1. DESCRIPTION
   A. This chapter presents the aircraft dimensions, control surface areas, water lines, buttock lines, and station designations as outlined in the text and illustrations.
   B. Dimensions are given in U.S. and metric measure for overall length, width (wing span), and height at vertical stabilizer. Areas are in U.S. and metric measure and are provided for wing and control surfaces. Measurements are carried to nearest full inch and centimeter.



Aircraft Dimensions
Figure 1 (Sheet 1 of 2)

EFFECTIVITY: ALL

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Page 1
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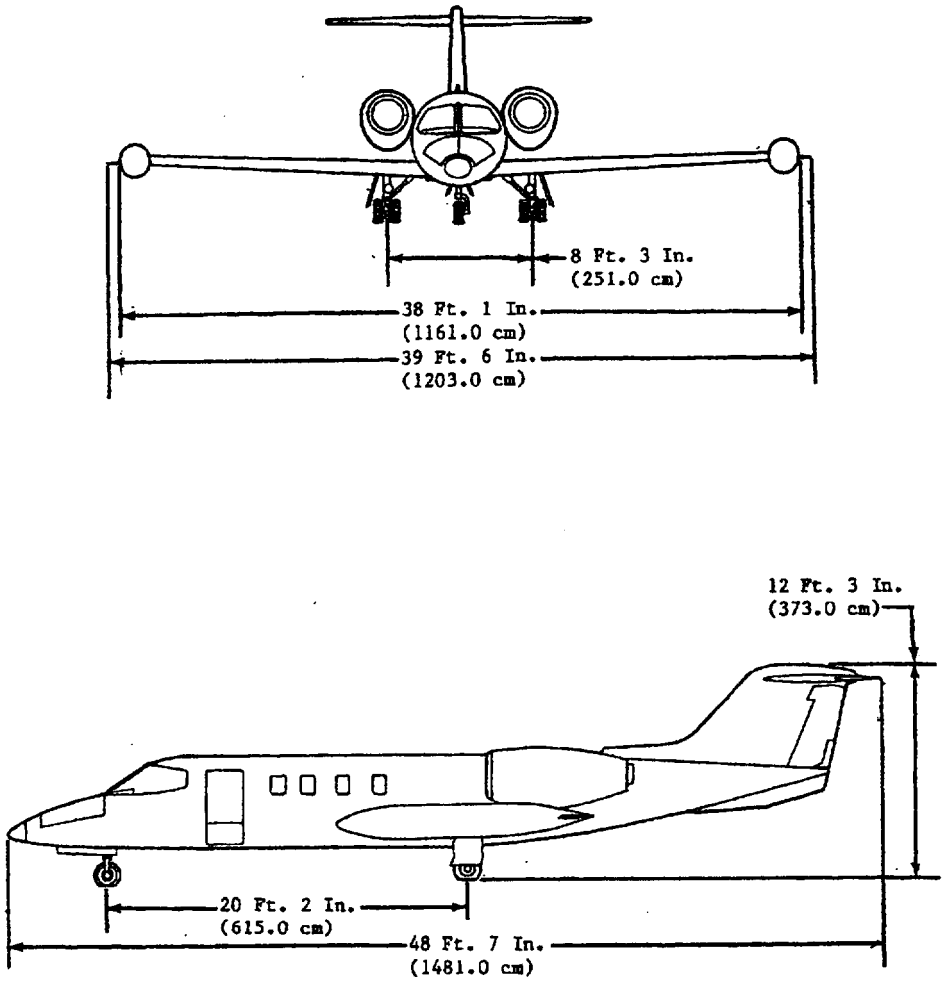

Aircraft Dimensions
Figure 1 (Sheet 2 of 2)

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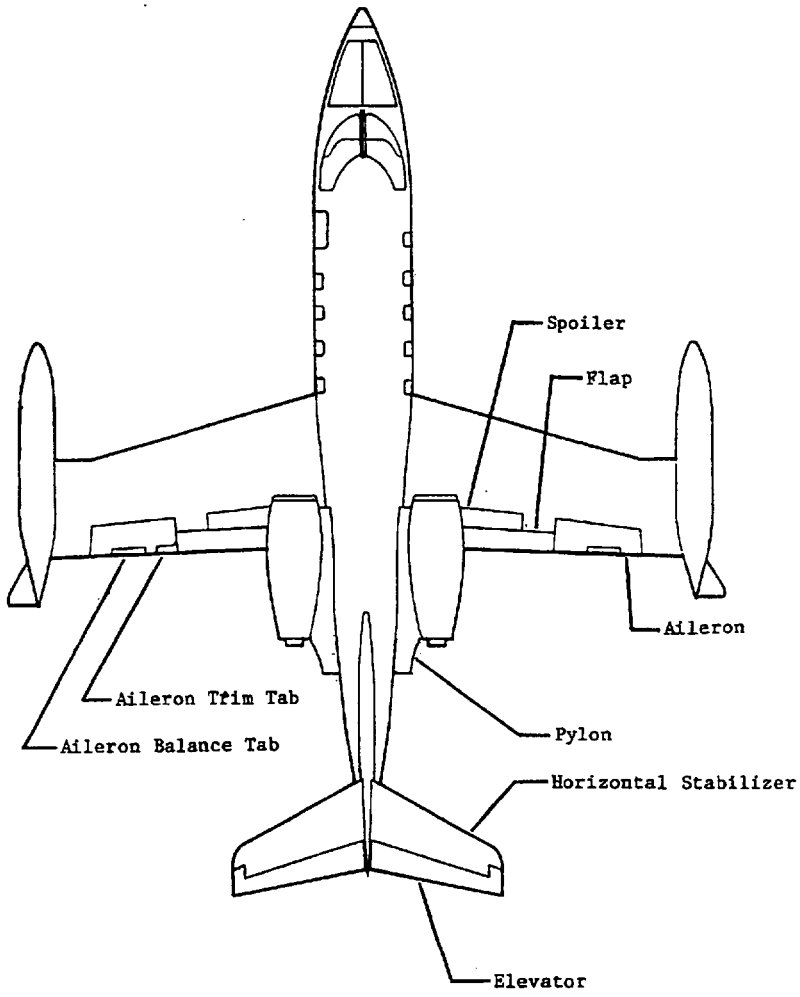

Aircraft Areas
Figure 1 (Sheet 1 of 2)

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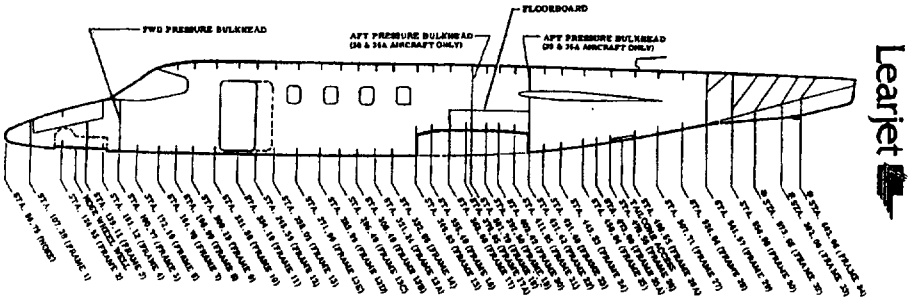
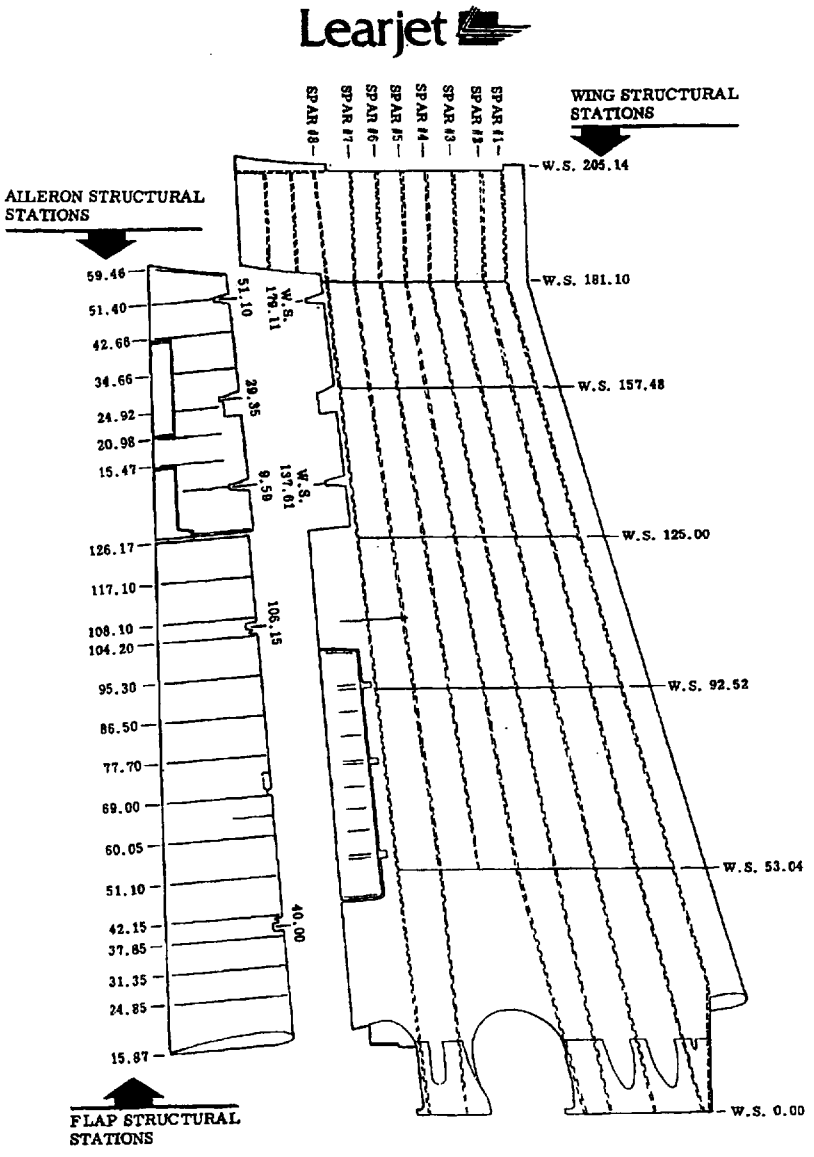
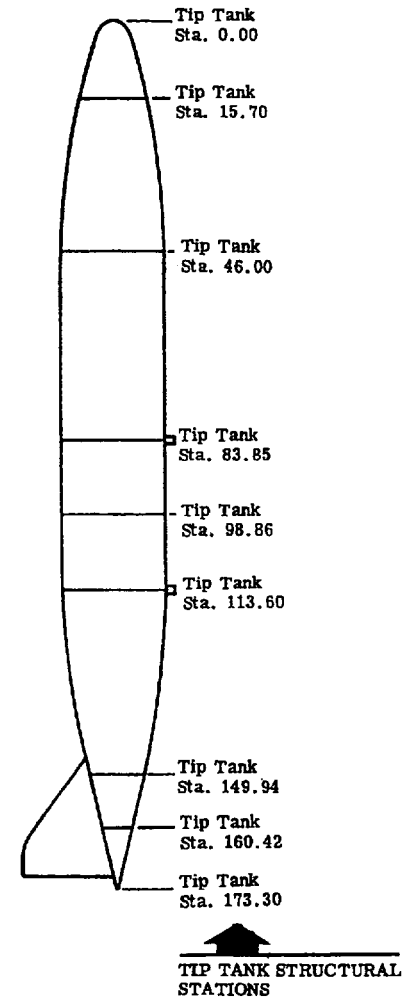
Fuselage Structural Station Diagram
Figure 1 (Sheet 1 of 2)



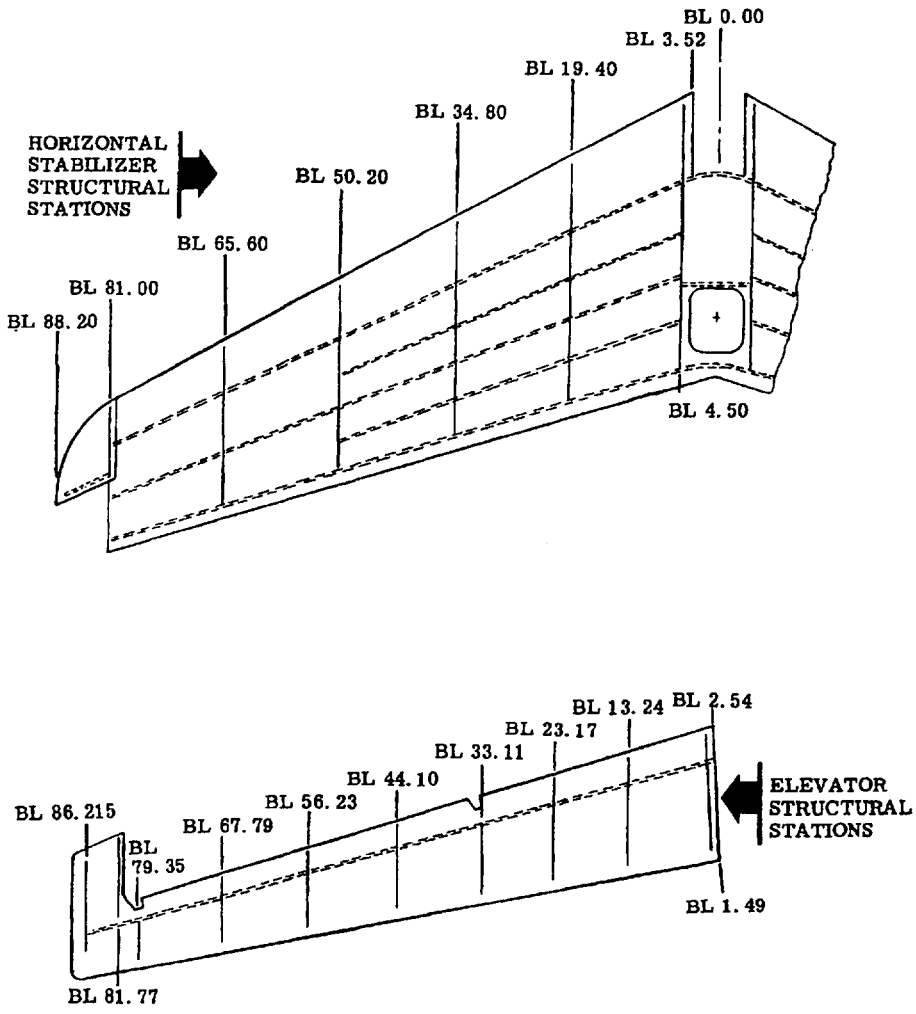
*Measured at outside mold line of bulkhead intersection with bottom CL of fuselage skin.



Wing, Aileron, and Flap Structural Station Diagram
Figure 2



Tip Tank Structural Station Diagram
Figure 3



Horizontal Stabilizer and Elevator Structural Stations Diagram
Figure 4

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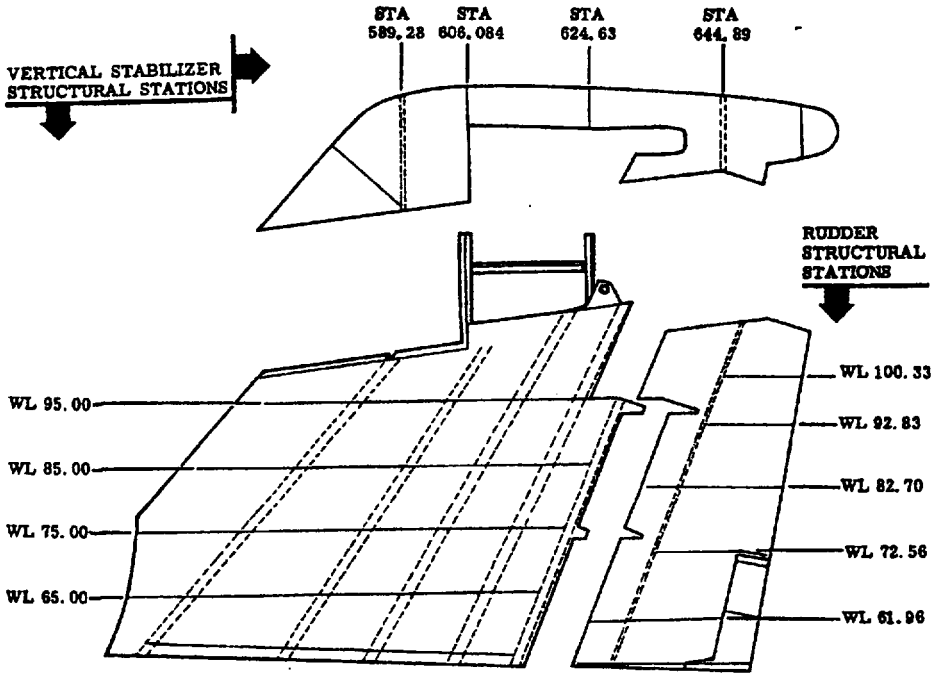

Vertical Stabilizer and Rudder Structural Stations Diagram
Figure 5

EFFECTIVITY: ALL

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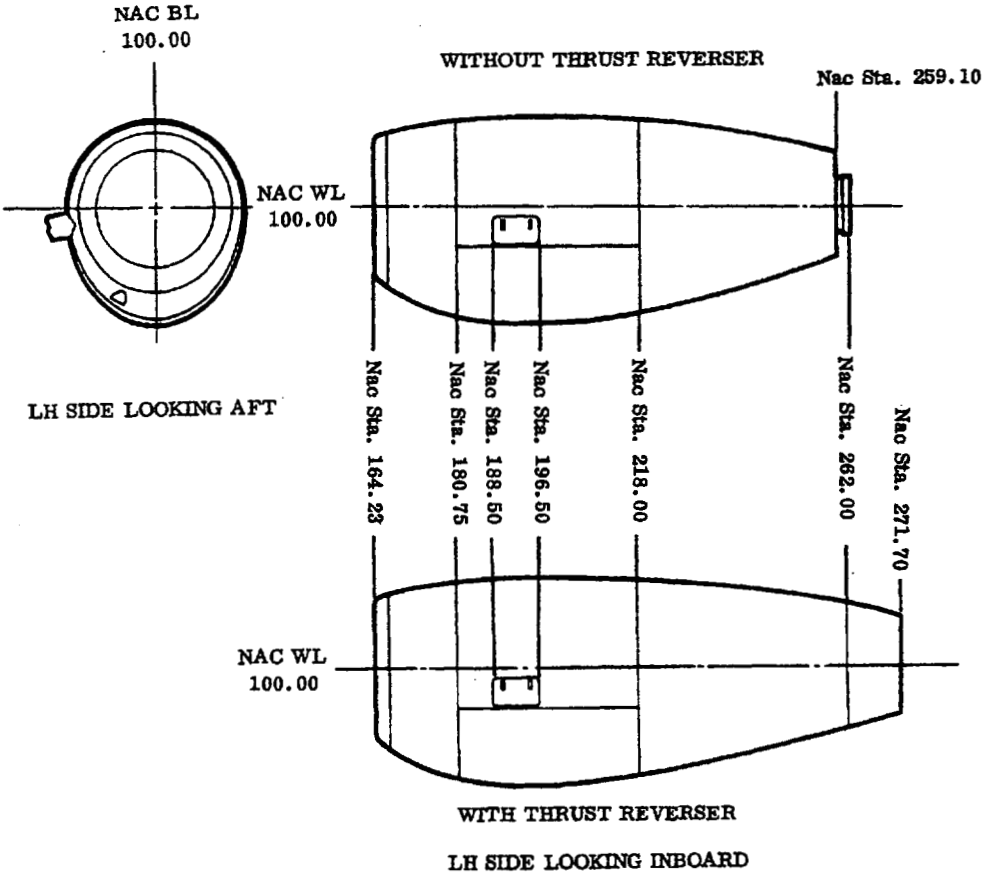

Nacelle Structural Station Diagram
Figure 6

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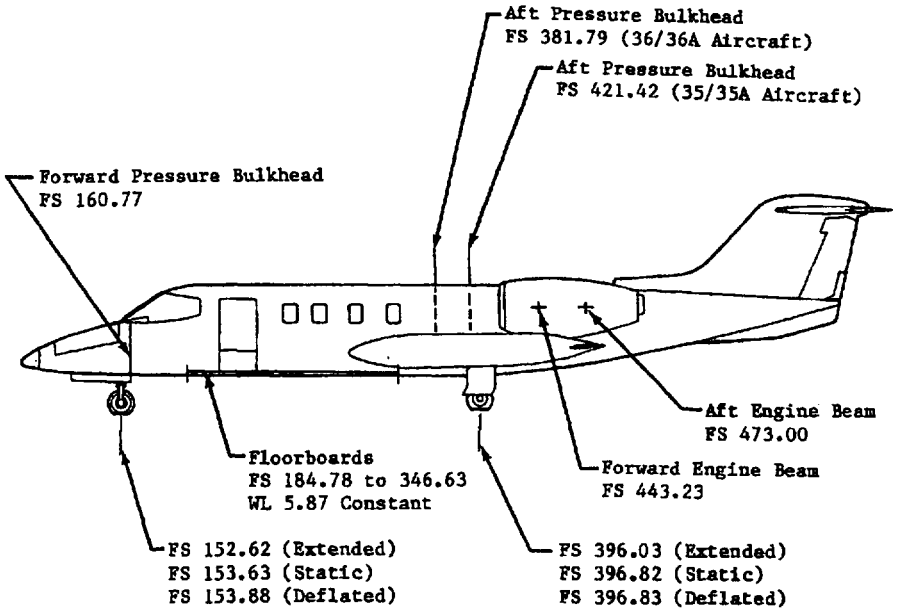
MAJOR STRUCTURAL MEMBERS - DESCRIPTION AND OPERATION

1. DESCRIPTION
   A. The location of some major structural members are shown in figure 1.



Major Structural Member Locations
Figure 1 (Sheet 1 of 2)

EFFECTIVITY: ALL

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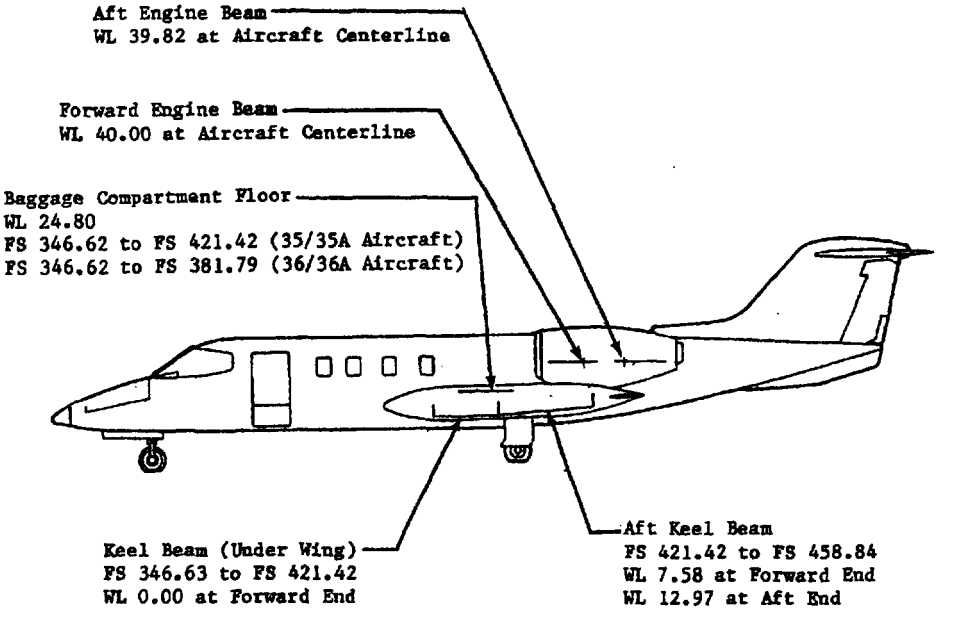

Major Structural Member Locations
Figure 1 (Sheet 2 of 2)

EFFECTIVITY: ALL

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AUXILIARY CABIN HEATER SWITCH

Auxiliary heating elements, located in the cooling system ducts, are powered by an auxiliary power unit or engine driven generator. The system consists basically of two heating elements in each duct, a control switch, a thermal switch and a thermal fuse. A safety switch is installed on the diverter doors to prevent heater operation with the doors open. With the diverter doors closed and the AUX HT switch set to HI, both heating elements are energized. The cooling system blower is energized after the elements are hot. With the switch set to LO, only one heater element in each duct is energized. Each heating unit has a thermal switch which cycles its element within a range of 125 to 150°F. The system controls operate on 28 vdc from the 7.5 amp AUX CAB HT circuit breaker.

PRESSURIZATION SYSTEM

Cabin pressurization (Figure 3-3) is provided by conditioned air entering the cabin through the air distribution ducts and controlled by modulating the amount of air exhausted from the cabin. Components of the pressurization system are a cabin air exhaust valve, cabin safety valve, differential pressure relief valve, pressurization jet pump and pressurization module. All pressurization controls and indicators are on a panel in front of the copilot. During ground operation, electrically controlled solenoids control the cabin air exhaust valve to maintain a maximum of 0.25 psi differential. During flight, power is removed from the electrically operated solenoids which makes the pressurization completely independent of the electrical system. With the AUTO-MAN switch in the AUTO position, controlling vacuum from the pressurization jet pump opens and closes the cabin air exhaust valve. As the exhaust valve closes the increase in cabin pressure is sensed by the altitude controller which meters more vacuum to the rate controller. As more vacuum is metered to the rate controller, the ratio of pressure to vacuum decreases. The reduced pressure in the up rate chamber of the rate controller is sensed by the exhaust control valve. With the changing control chamber pressure, an unbalanced condition will exist and move the valve open until the proper amount of air is exhausted to maintain the altitude controller selection. The reduced pressure is also sensed by the rate chamber of the rate controller and as pressure decreases, the down rate needle valve opens, metering more cabin pressure to the vacuum source. An aneroid switch will limit cabin altitude to 10,000 feet when in the AUTO mode. With the AUTO-MAN switch in the MAN position, the cabin altitude is controlled by manually positioning the outflow valve with the red UP-DN switch.

pilot's manual LEARJET 35 36

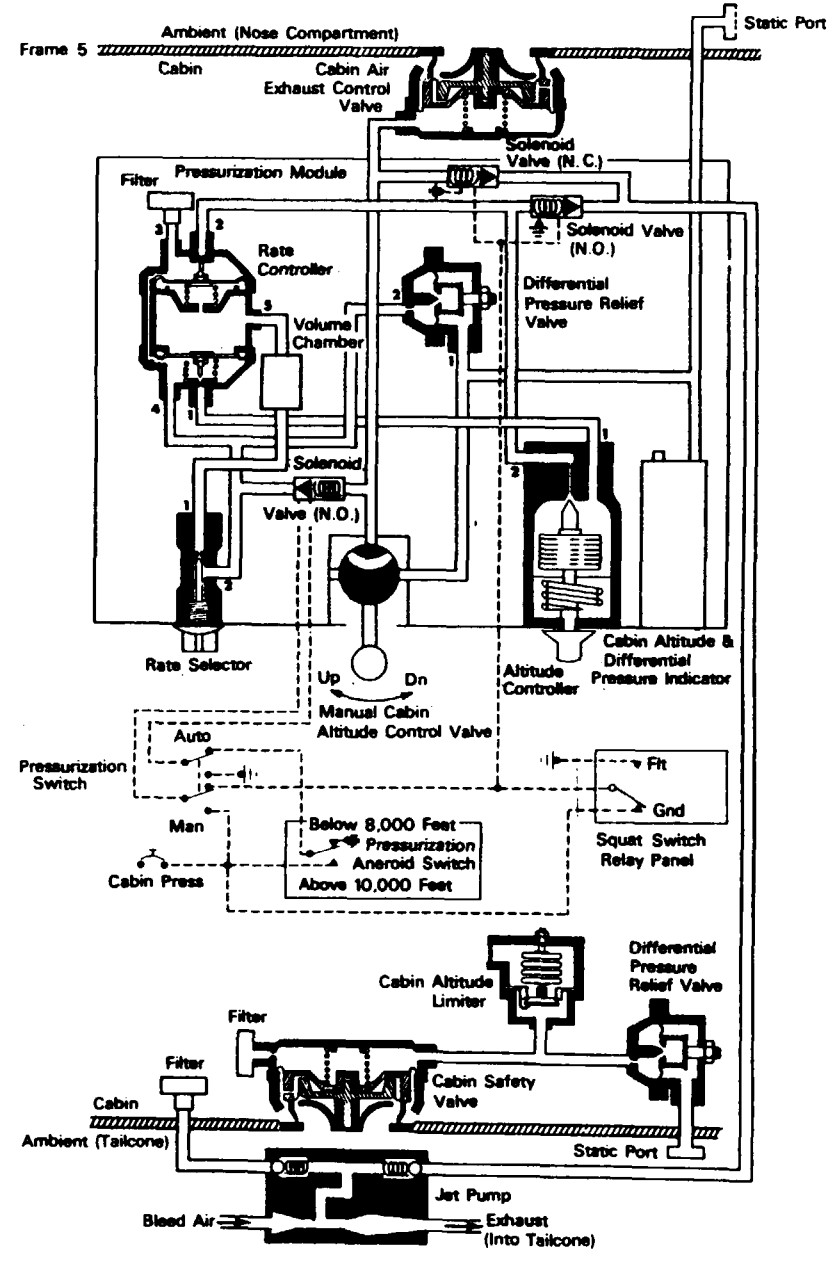
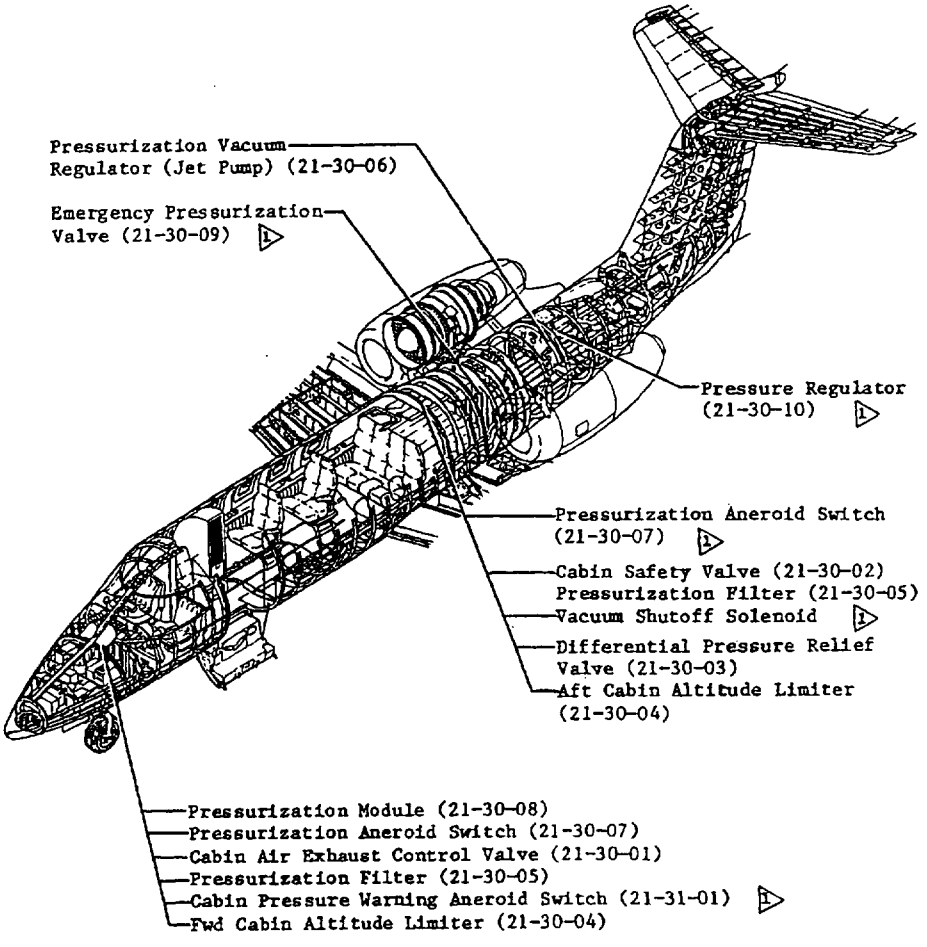


Figure 3-3 Pressurization System Schematic

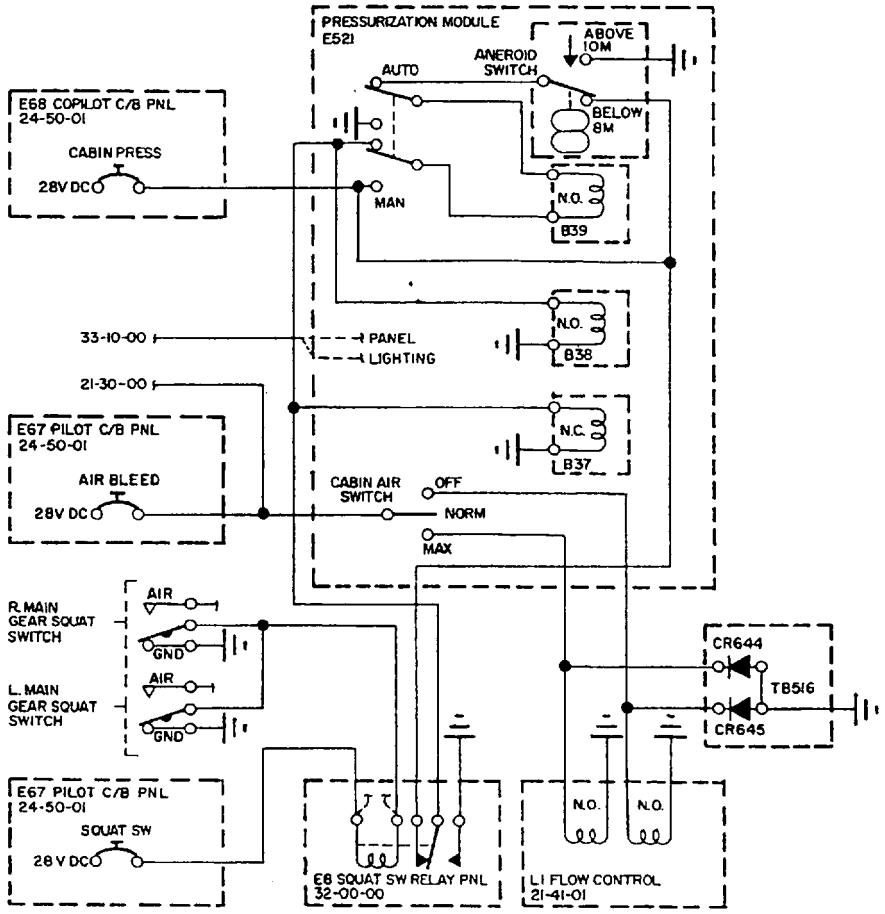


1 Effective Aircraft 35-107, 35-113 and Subsequent, and 36-032 and Subsequent

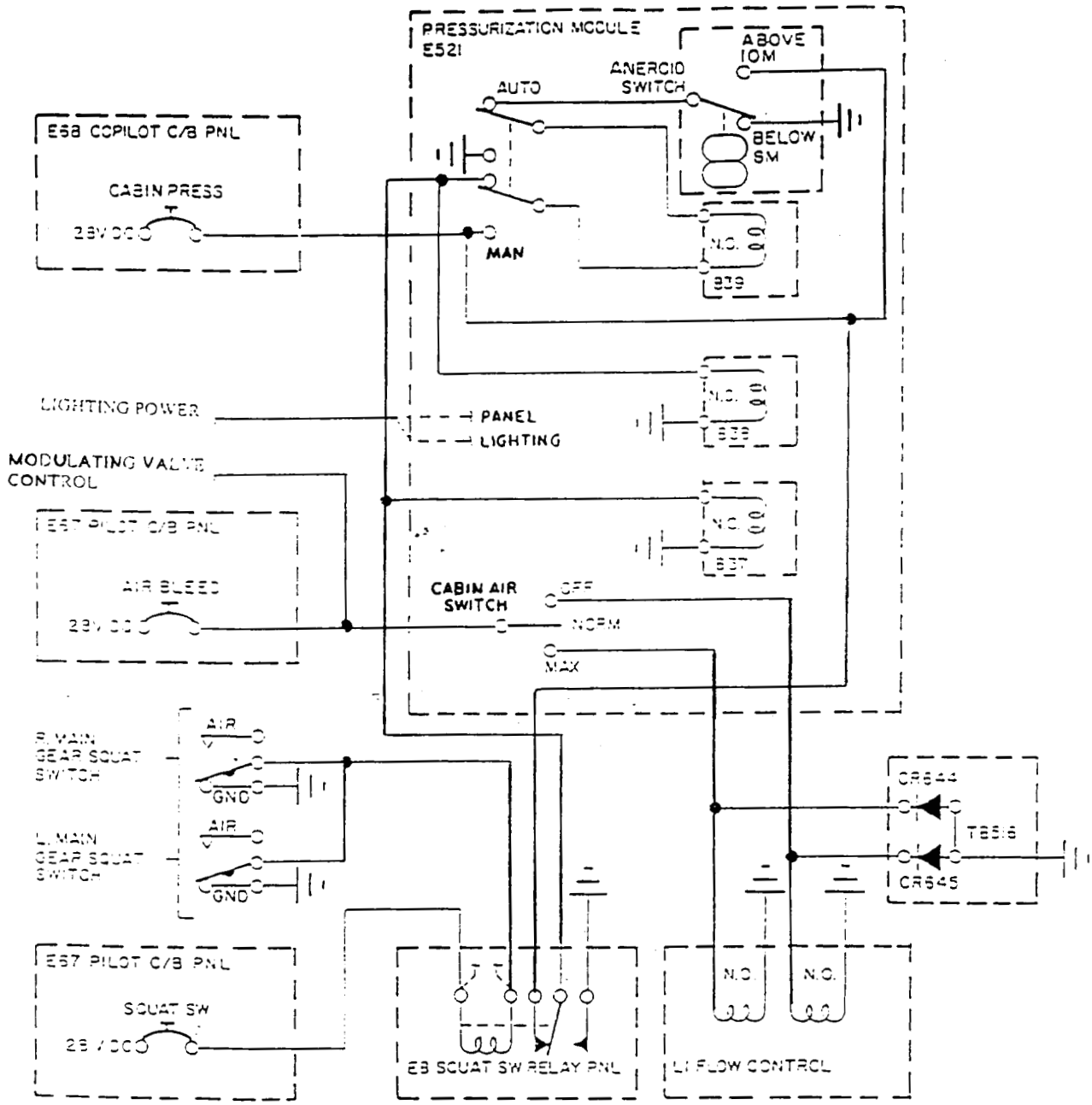
Pressurization System Component Locator (Typical)
Figure 1

Gates Learjet Corporation

maintenance manual



Pressurization System Electrical Control Schematic
35S2130B **Figure 2 (Sheet 1 of 3)**



NOTES:

1. CABIN AIR SWITCH IN "NORM" POSITION FLOW CONTROL VALVE L1 REGULATES FLOW TO 12 LBS/MIN NOMINAL.

2. CABIN AIR SWITCH IN "MAX" POSITION FLOW CONTROL VALVE L1 OPENS TO FULL OPEN POSITION.

3. SOLENOID VALVE B39 ISOLATES AUTOMATIC PORTION OF PRESSURIZATION SYSTEM IN THE EVENT OF AN AUTO MODE FAILURE WHEN POWERED CLOSED.

4. SOLENOID VALVE B38 ALLOWS AUTOMATIC CONTROL OF THE OUTFLOW VALVE WHEN POWER IS REMOVED (AIR MODE).

5. SOLENOID VALVE B37 PROVIDES CABIN DEPRESSURIZATION ON THE GROUND WHEN POWERED OPEN.

6. CABIN ALTITUDE ANEROID SWITCH CLOSES AT 10,000 ± 500 FEET ASCENDING AND RESETS ON OR BEFORE 7,500 FEET DESCENDING.

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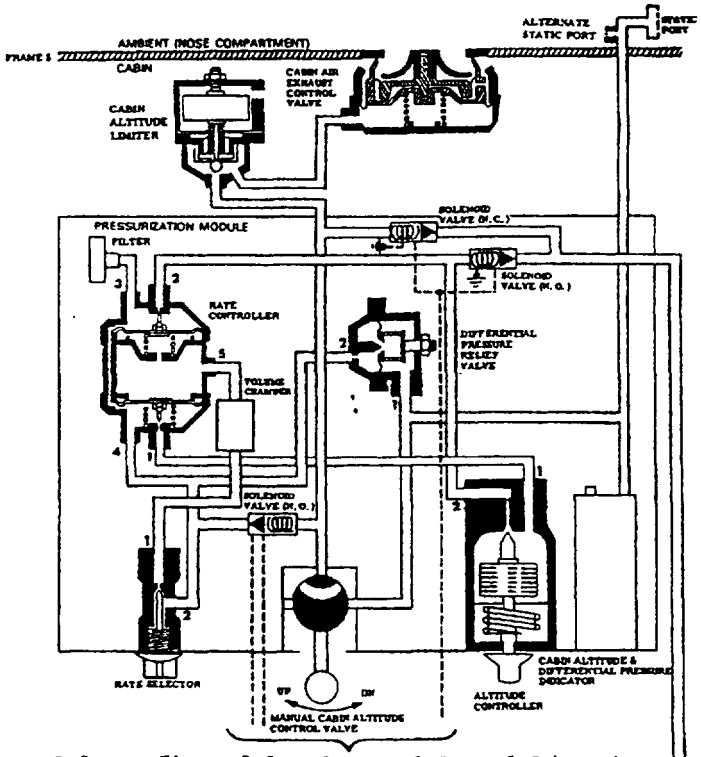
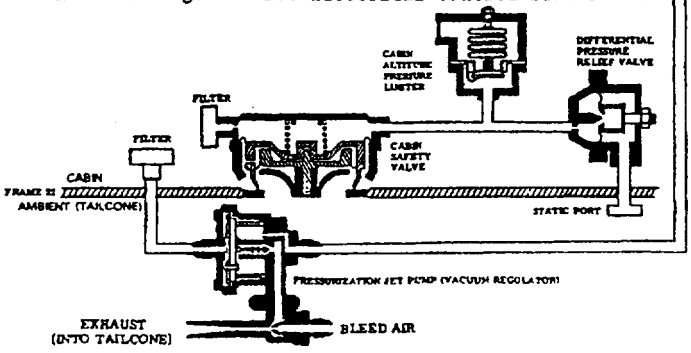
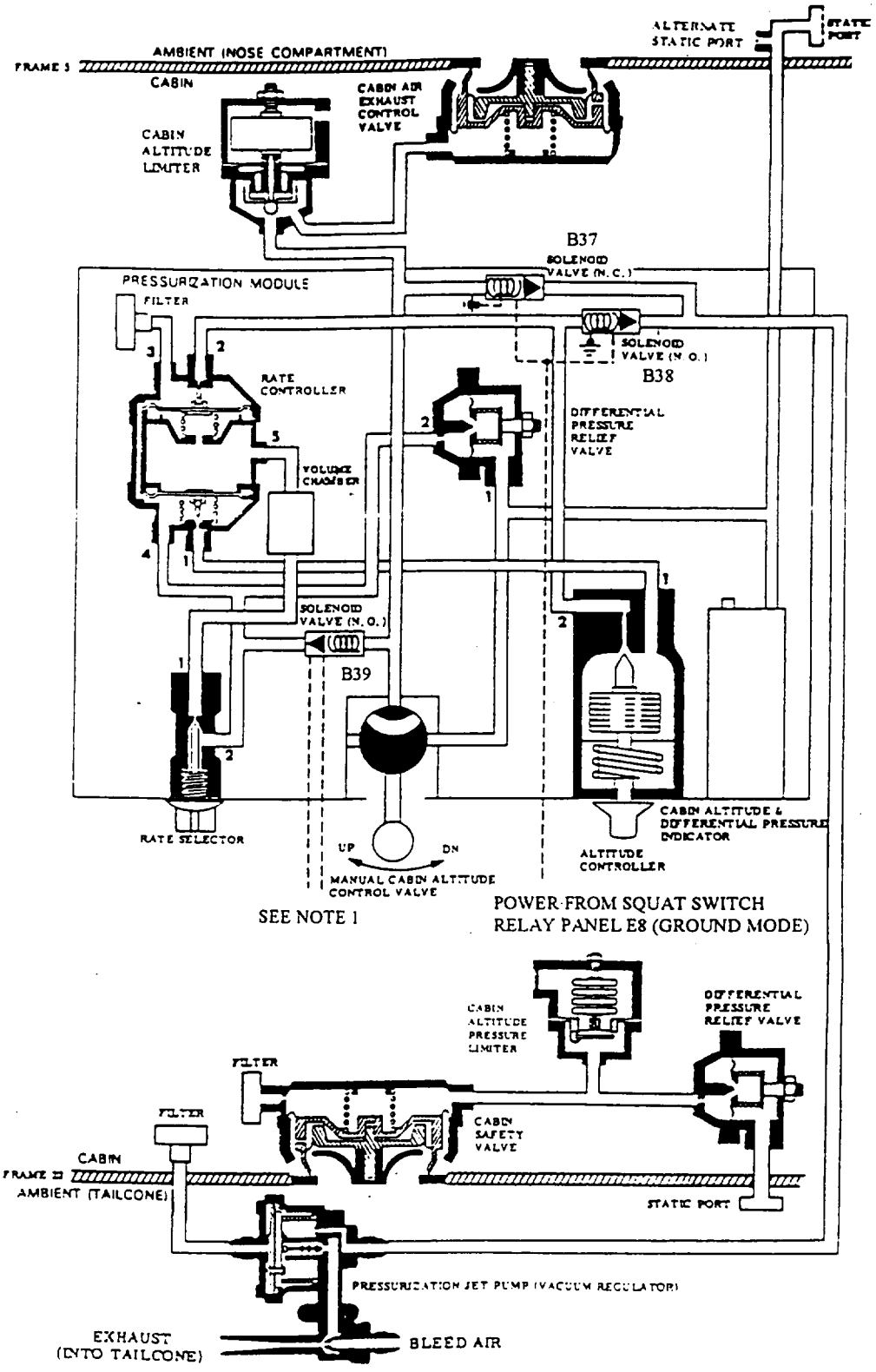


Refer to Figure 2 for Electrical Control Schematic.



Pressurization System Control Schematic
Figure 3 (Sheet 3 of 6)

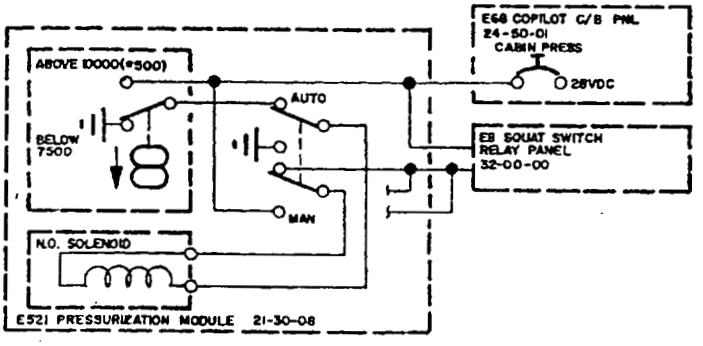


NOTES:

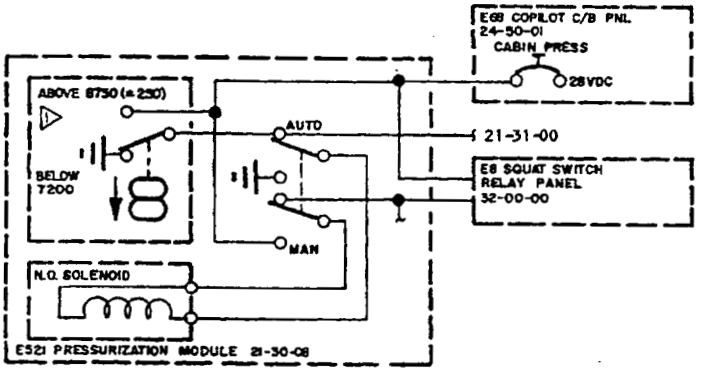
1. MANUAL SOLENOID VALVE B39 IS POWERED CLOSED IN GROUND MODE WITH AUTO/MAN SWITCH IN AUTO OR MANUAL. IN AIR MODE MANUAL SOLENOID VALVE B39 IS POWERED CLOSED WHEN CABIN ALTITUDE EXCEEDS 10,000 ± 500 FEET OR AUTO/MAN SWITCH IS SELECTED TO MANUAL POSITION
2. CABIN RATE OF CLIMB INDICATOR IS NOT SHOWN
3. ALTITUDE LIMITER SHOWN FOR OUTFLOW VALVE IS INSTALLED BY AIRPLANE MODIFICATION KIT (AMK) AMK78-5.
4. OUTFLOW VALVE AND SAFETY VALVE ALTITUDE LIMITER OPENS AT 11,000 ± 1,500 FEET CABIN ALTITUD

Gates Learjet Corporation

maintenance manual



35-002 thru 35-106, 35-108 thru 35-112 and 36-002 thru 36-031



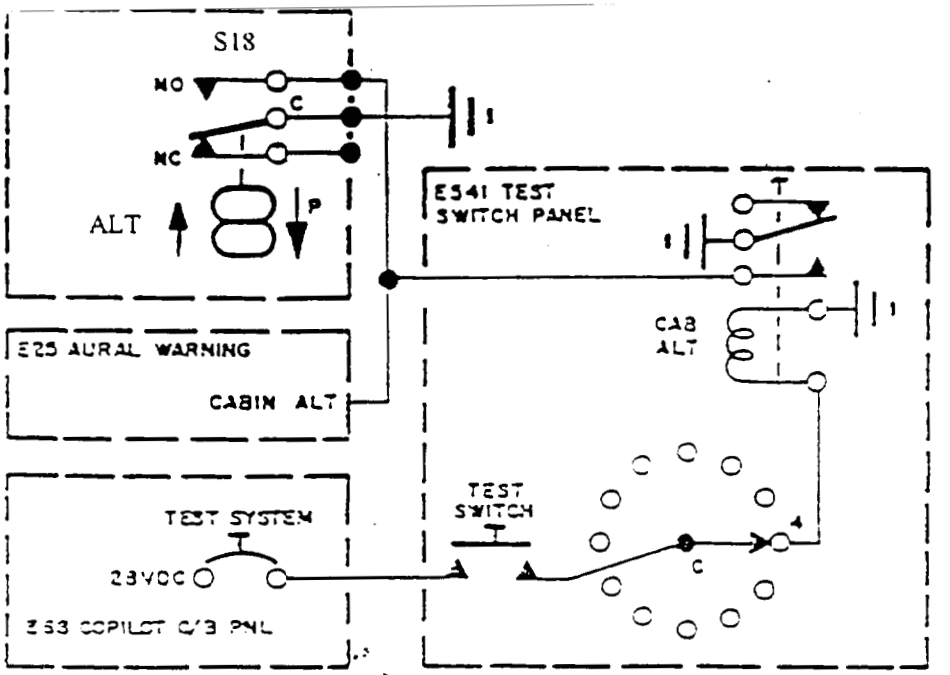
1 * On Aircraft 35-107, 35-113 thru 35-128 and 36-032, the cabin air exhaust control valve aneroid switch actuates at 9000 (±250) feet and resets on or before 7570 feet.

* On Aircraft 35-127 and Subsequent and 36-033 and Subsequent, the cabin air exhaust control valve aneroid switch actuates at 8750 (±250) feet and resets on or before 7200 feet minimum.

35-107, 35-113 and Subsequent, 36-032 and Subsequent

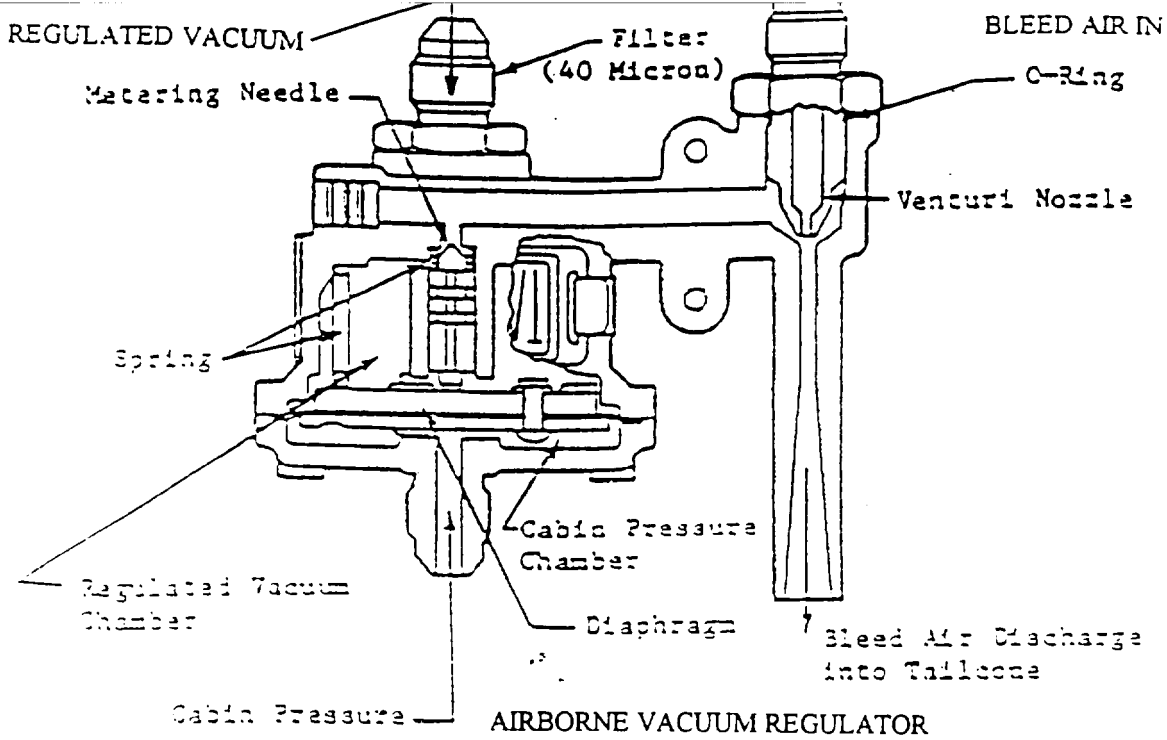
Cabin Air Exhaust Control Valve Aneroid Switch

Pressurization Aneroid Switch Electrical Control Schematic
Figure 9 (Sheet 1 of 2)

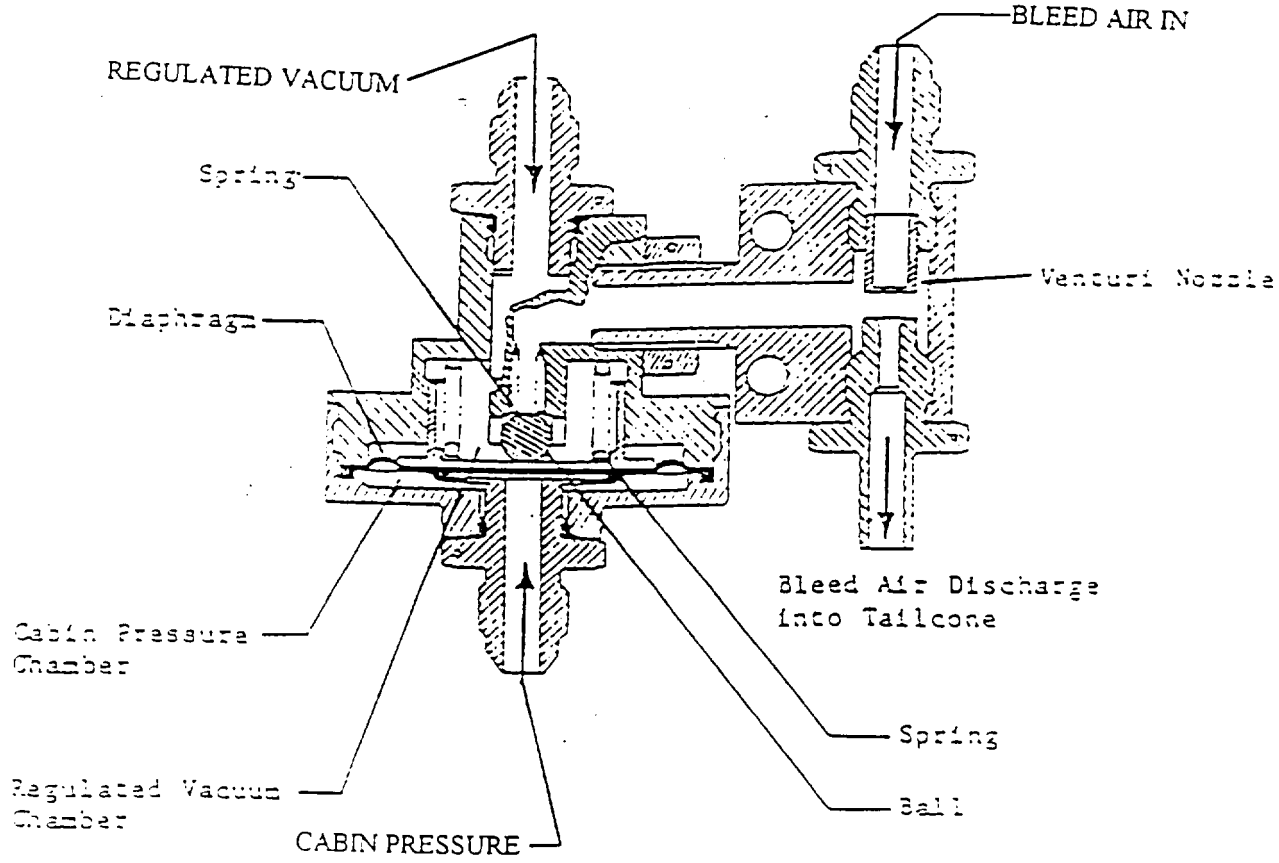


NOTES:

1. CABIN ALTITUDE ANEROID SWITCH CLOSES AT 10,000± 500 FEET ASCENDING AND RESETS ON OR BEFORE 7,500 FEET DESCENDING.



AIRBORNE VACUUM REGULATOR

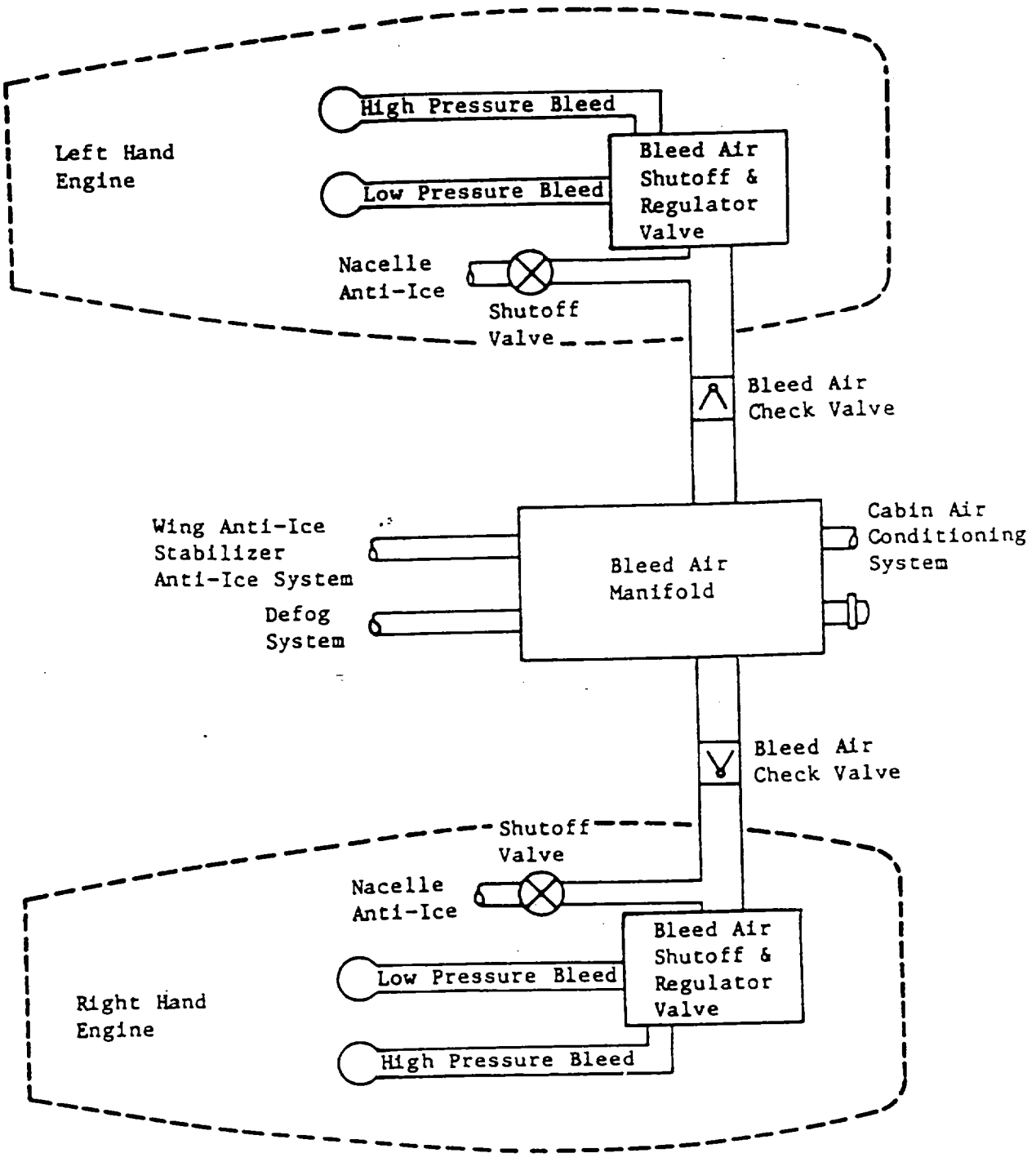


STERER VACUUM REGULATOR

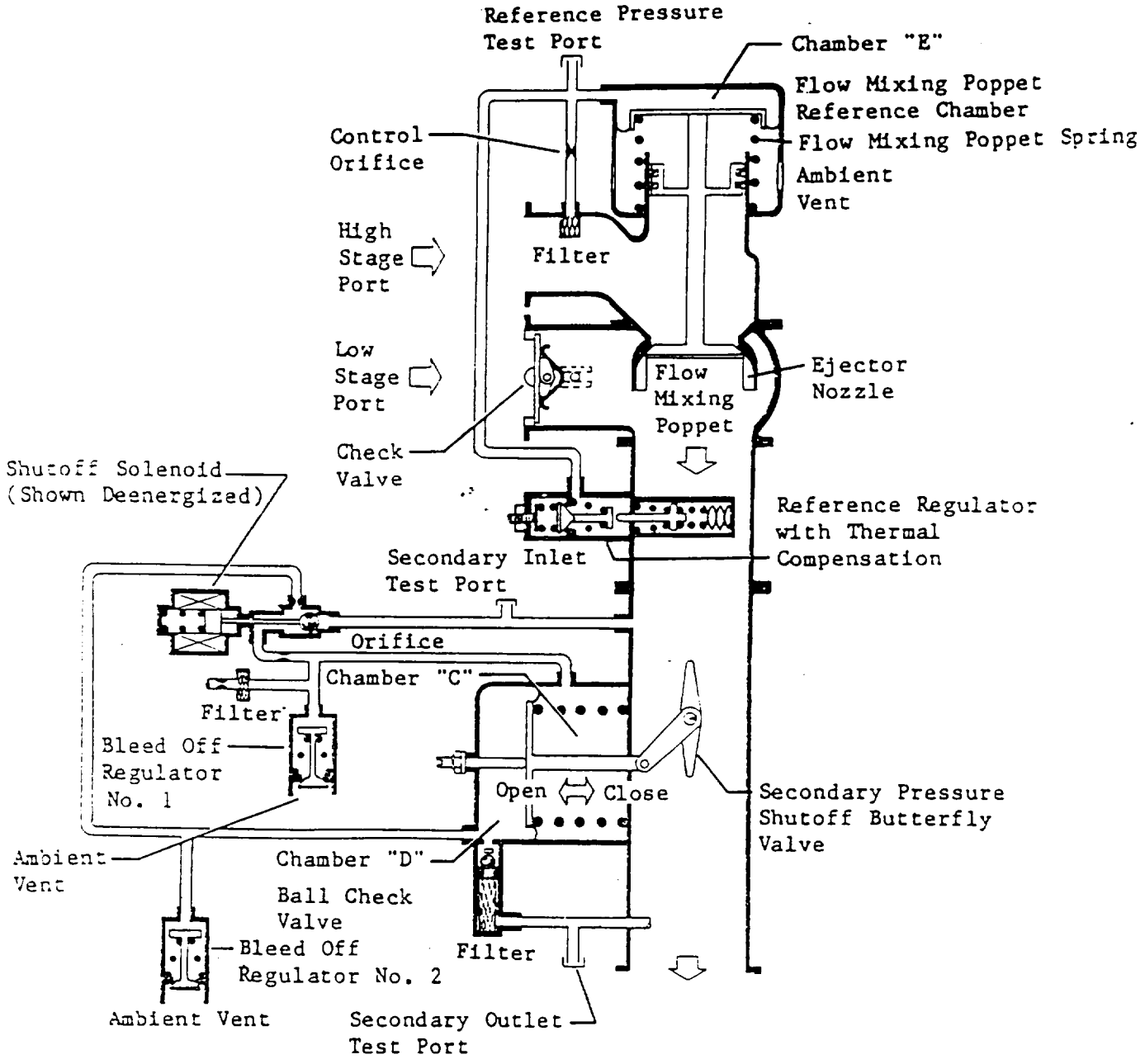
NOTES:

1. VACUUM REGULATION:
   4.0 ± 0.75 INCHES OF MERCURY BELOW CABIN PRESSURE
   (54.44 ± 10.2 INCHES OF WATER).

   FLOW RATE 0 - .020 POUNDS PER MINUTE.



PNEUMATIC SYSTEM



ENGINE BLEED AIR SHUTOFF/REG.

(MOD) VALVE

AUXILIARY AND EMERGENCY SYSTEMS

AIR CONDITIONING AND HEATING

Cabin temperature is regulated by controlling the temperature of pressurization bleed air that enters the cabin. With the BLEED AIR switches ON and the CABIN AIR switch in the NORM position, engine bleed air is admitted through the flow control valve to the heat exchanger. Engine bleed air is precooled in the heat exchanger by ram air entering the dorsal inlet and passing through the heat exchanger. The amount of bleed air passing through the heat exchanger is controlled by the MAN-HOT-COLD switch or MAN-AUTO-HOT rheostat switch which regulates the position of the hot air bypass valve. The position of the hot air bypass valve is indicated on the TEMP CONT INDICATOR. With the rheostat switch in the HOT position or the MAN-HOT-COLD switch in the HOT position the indicator needle should be at the OPEN position. The precooled bleed air is ducted through the air distribution lines into the cabin area. If maximum airflow is desired to remove smoke or fumes from the cabin, set the CABIN AIR switch to MAX. This energizes a solenoid on the flow control valve which overrides the venturi and fully opens the flow control valve.

CABIN CLIMATE CONTROL SWITCHES

With the MAN-AUTO-HOT rheostat type switch in the AUTO position, cabin temperature is controlled by regulating the position of the hot air bypass valve with a temperature resistance bridge circuit and temperature control unit. Cabin temperature is increased by rotating the switch toward the hot position. With the rheostat in the MAN position (the detent in the full counterclockwise direction), the hot air bypass valve position is regulated by the MAN-HOT-COLD switch.

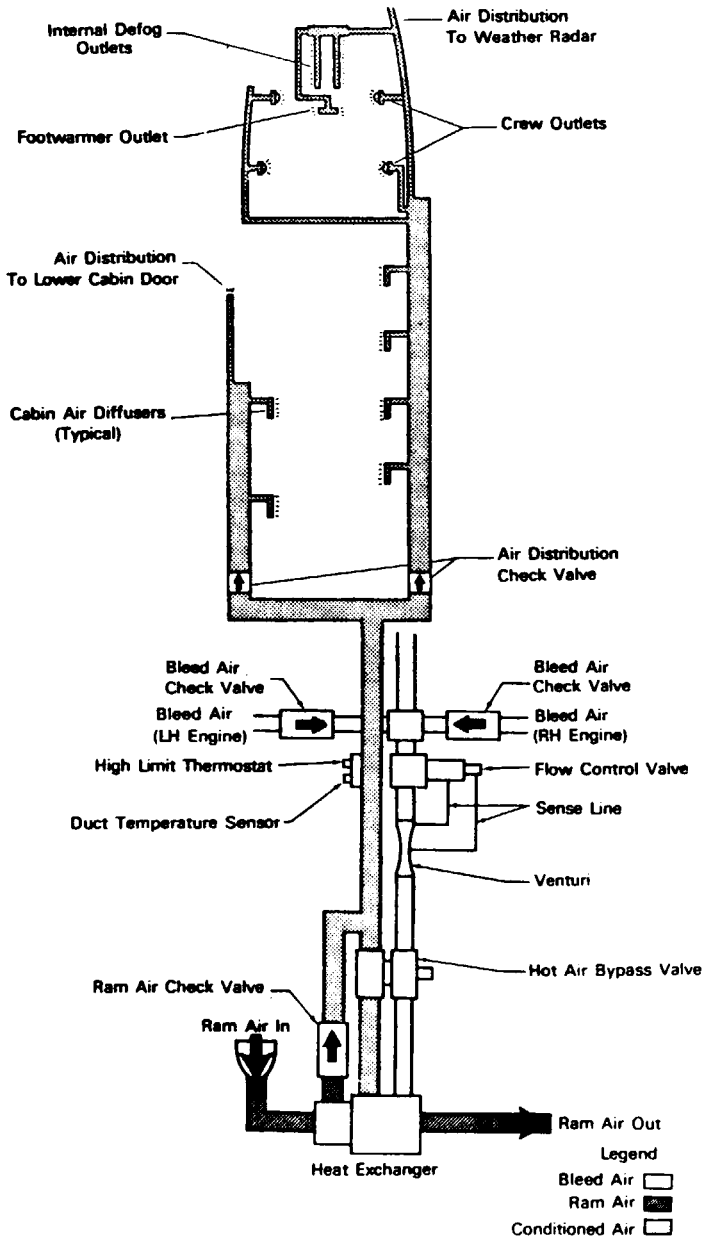
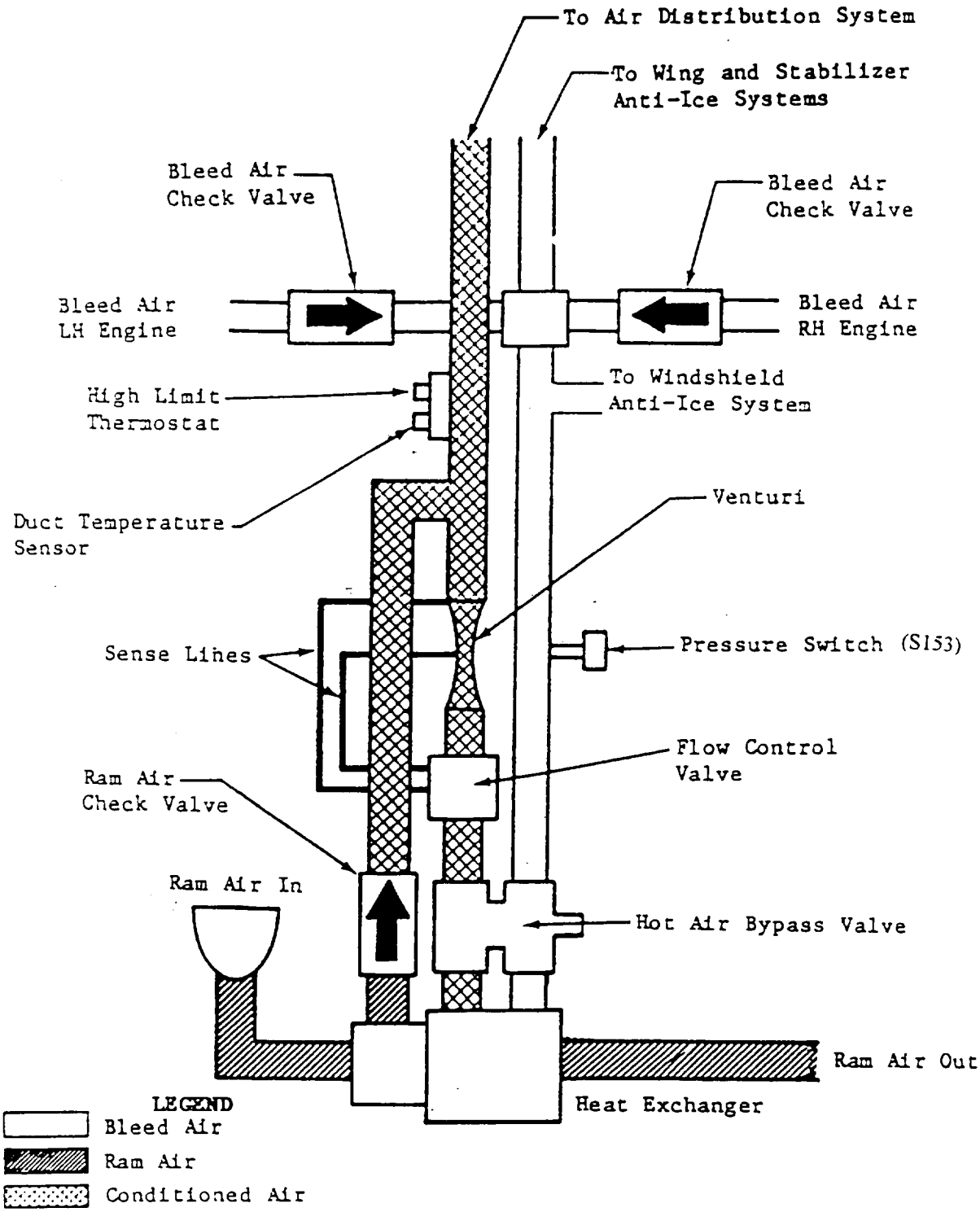


Figure 3-1 Air Conditioning System Schematic



NOTES:

1. S153 CLOSES AT 47 PSIG INCREASING AND OPENS ON DECREASING PRESSURE AT 38 PSIG.

2. FLOW CONTROL VALVE RELOCATED DOWNSTREAM OF HEAT EXCHANGER PER AIRPLANE MODIFICATION KIT AMK76-7.

PRESSURIZATION CONTROLS

Normal pressurization is controlled with the Altitude Controller and the RATE Selector. Prior to takeoff, the AUTO-MAN switch is set to AUTO, the Cabin Air Switch to NORM, the Airplane Altitude Selector knob set to cruise altitude and the IN NORMAL/OUT DEFOG knob pushed in. After takeoff the rate knob may be turned toward INCR or DECR to obtain a recommended rate of cabin pressurization of 600 (±50) fpm. The rate is monitored by the Cabin Rate-of-Climb Indicator and may be varied with the RATE Selector knob. Cabin altitude is monitored with the Cabin Altimeter. This altimeter also includes an aircraft cabin altitude and pressure differential scale.

CABIN ALTITUDE WARNING

If cabin altitude reaches 10,000 feet, the cabin pressurization aural warning will sound. The aural warning may be silenced for approximately 60 seconds by moving the HORN SILENCE-OFF switch to the HORN SILENCE position. The warning circuit may be tested by turning the test switch to CABIN ALT and depressing the center button.

EMERGENCY CABIN PRESSURIZATION

The windshield defog air can be routed into the cabin as an emergency source of pressurization. This is accomplished by pushing the IN NORMAL/OUT DEFOG knob (full in), setting the Windshield Heat Switch to AUTO and the CABIN AIR Switch OFF. Pressurization will then be maintained automatically. If however, pressurization is not maintained in the AUTO position, cabin altitude can be maintained by controlling the outflow valve using the manual UP/DN switch.

ANTI-ICING SYSTEMS

Three methods are used to prevent the formation of ice on various portions of the aircraft. Engine bleed air is used to prevent ice formation on the wing leading edges, horizontal stabilizer leading edges, nacelle inlet and windshield. Electrical heaters are used for the pitot heads, static ports and angle of attack transducer vanes. Methyl alcohol is used for the radome and as a backup for the pilot's windshield bleed air system.

ICE DETECTION

Identification of ice on the aircraft can be made visually by ice formation on the lower corners of the windshield or the nose of the tip tanks. During night flight, a red ice detect light located on each side of the

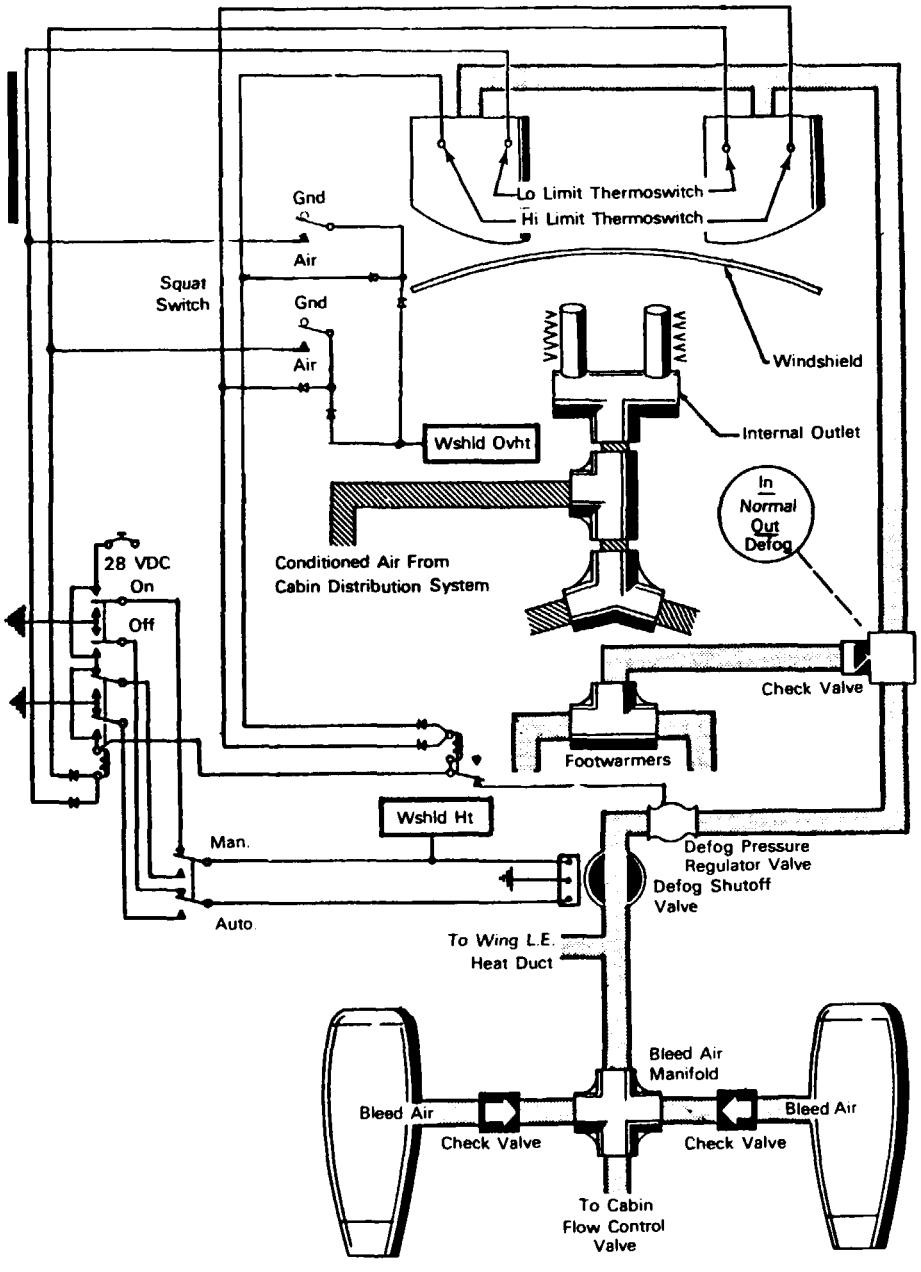
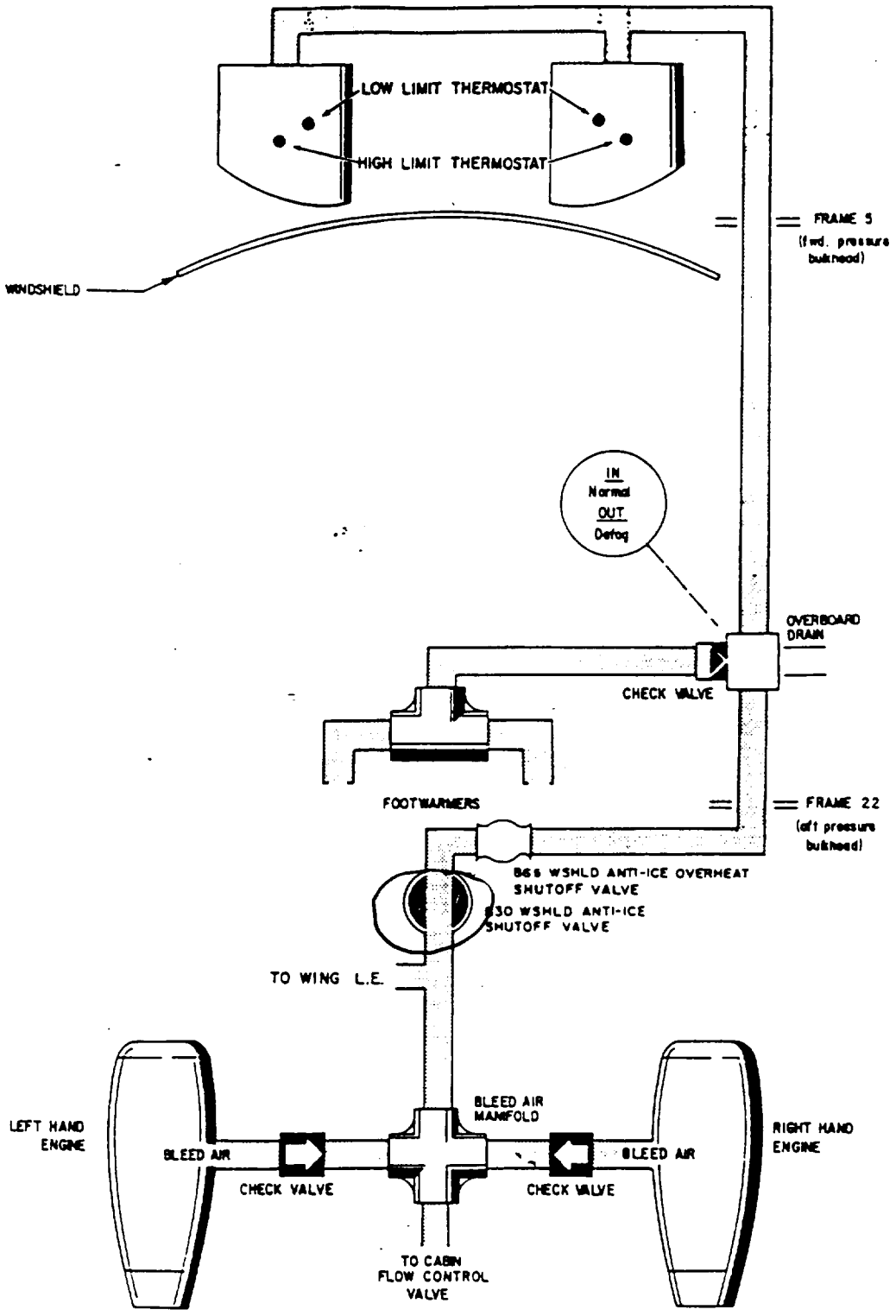


Figure 3-6 Windshield Defog System Schematic

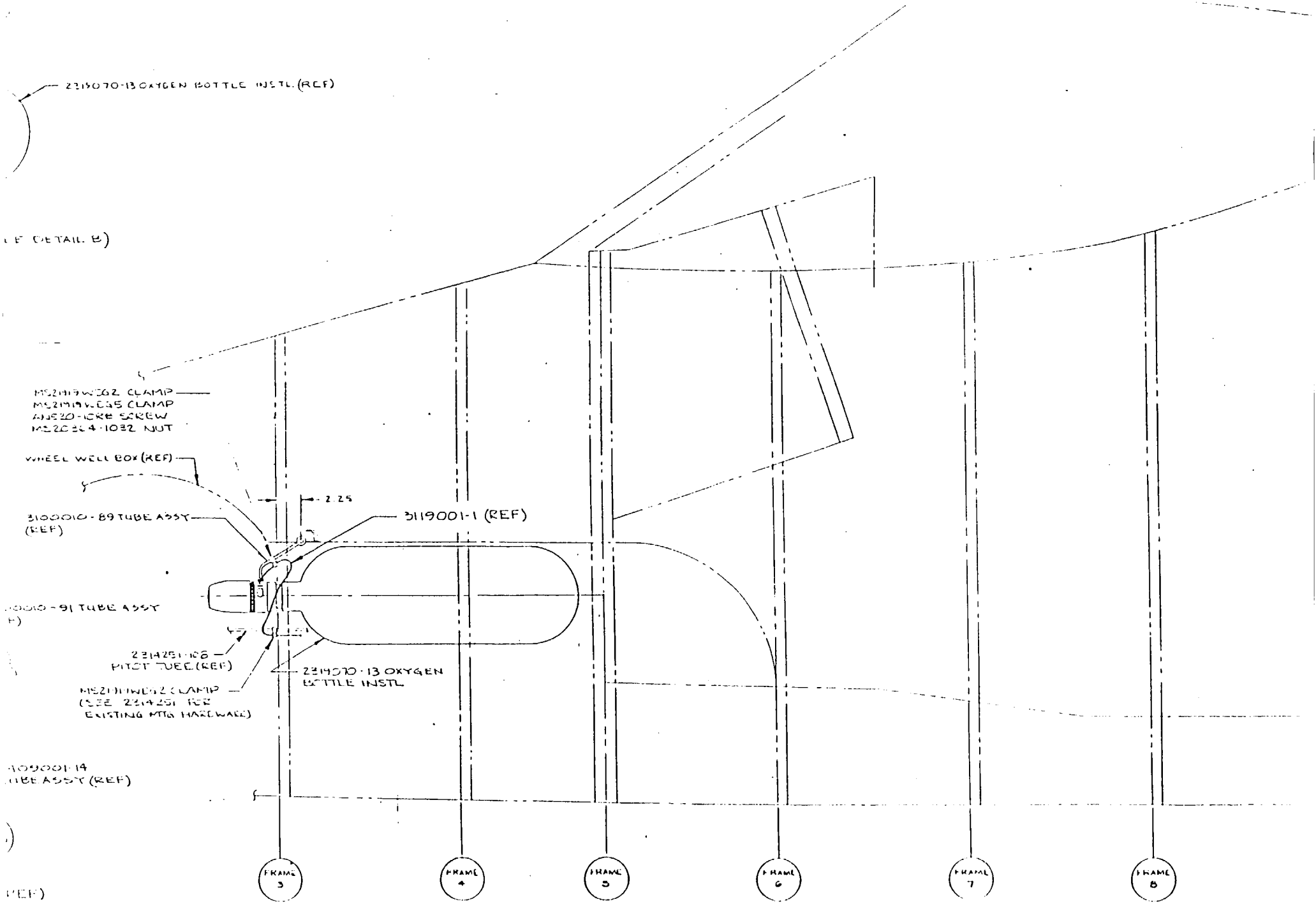

LOW LIMIT THERMOSTAT
HIGH LIMIT THERMOSTAT
FRAME 5
(fwd. pressure bulkhead)
WINDSHIELD
IN
Normal
OUT
Defog
OVERBOARD DRAIN
CHECK VALVE
FOOTWARMERS
FRAME 22
(aft pressure bulkhead)
865 WSHLD ANTI-ICE OVERHEAT SHUTOFF VALVE
830 WSHLD ANTI-ICE SHUTOFF VALVE
TO WING L.E.
LEFT HAND ENGINE
BLEED AIR
CHECK VALVE
BLEED AIR MANIFOLD
BLEED AIR
CHECK VALVE
RIGHT HAND ENGINE
TO CABIN FLOW CONTROL VALVE

LEARJET MODEL 35
OXYGEN SYSTEM
November 30, 1999

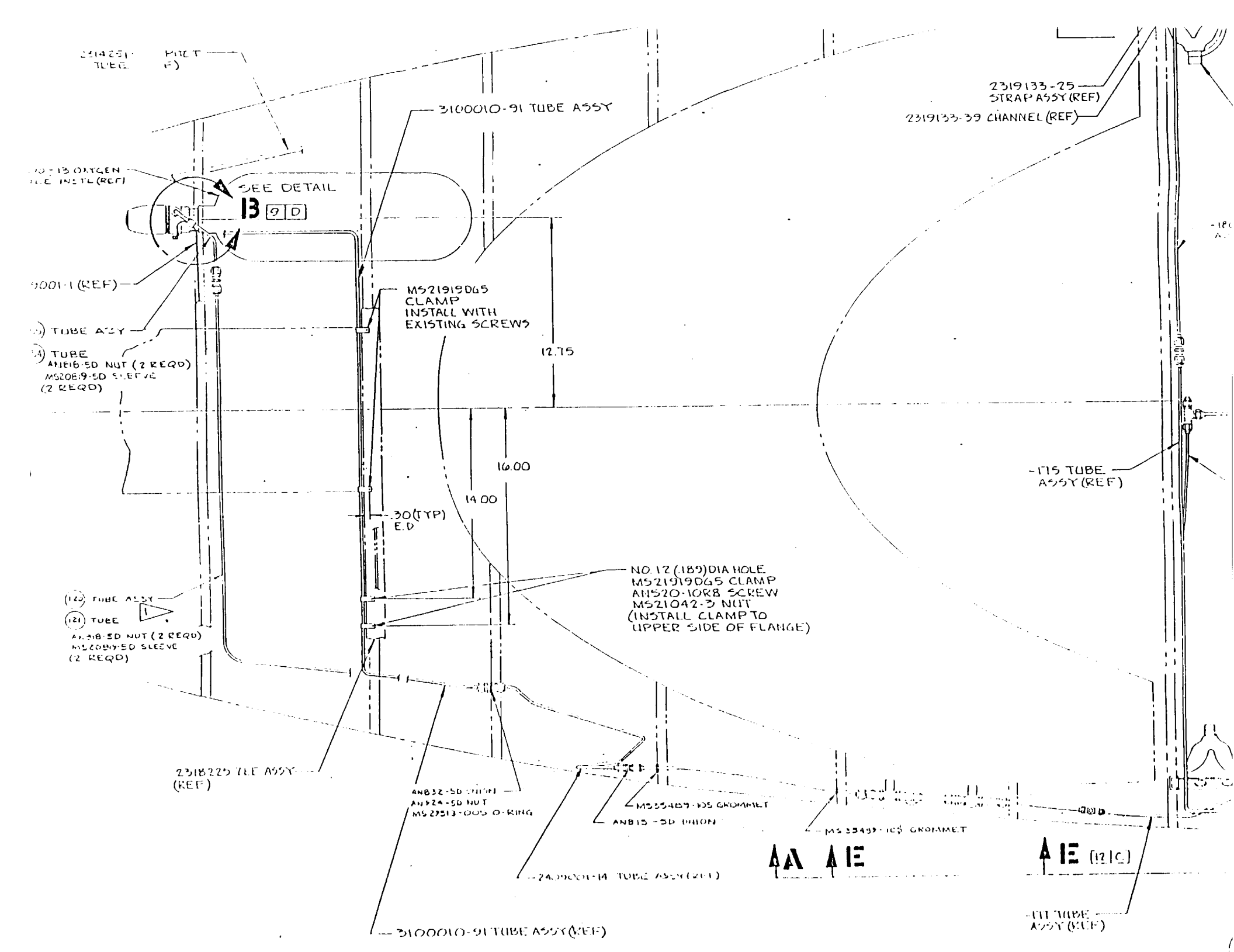
Nose compartment oxygen system

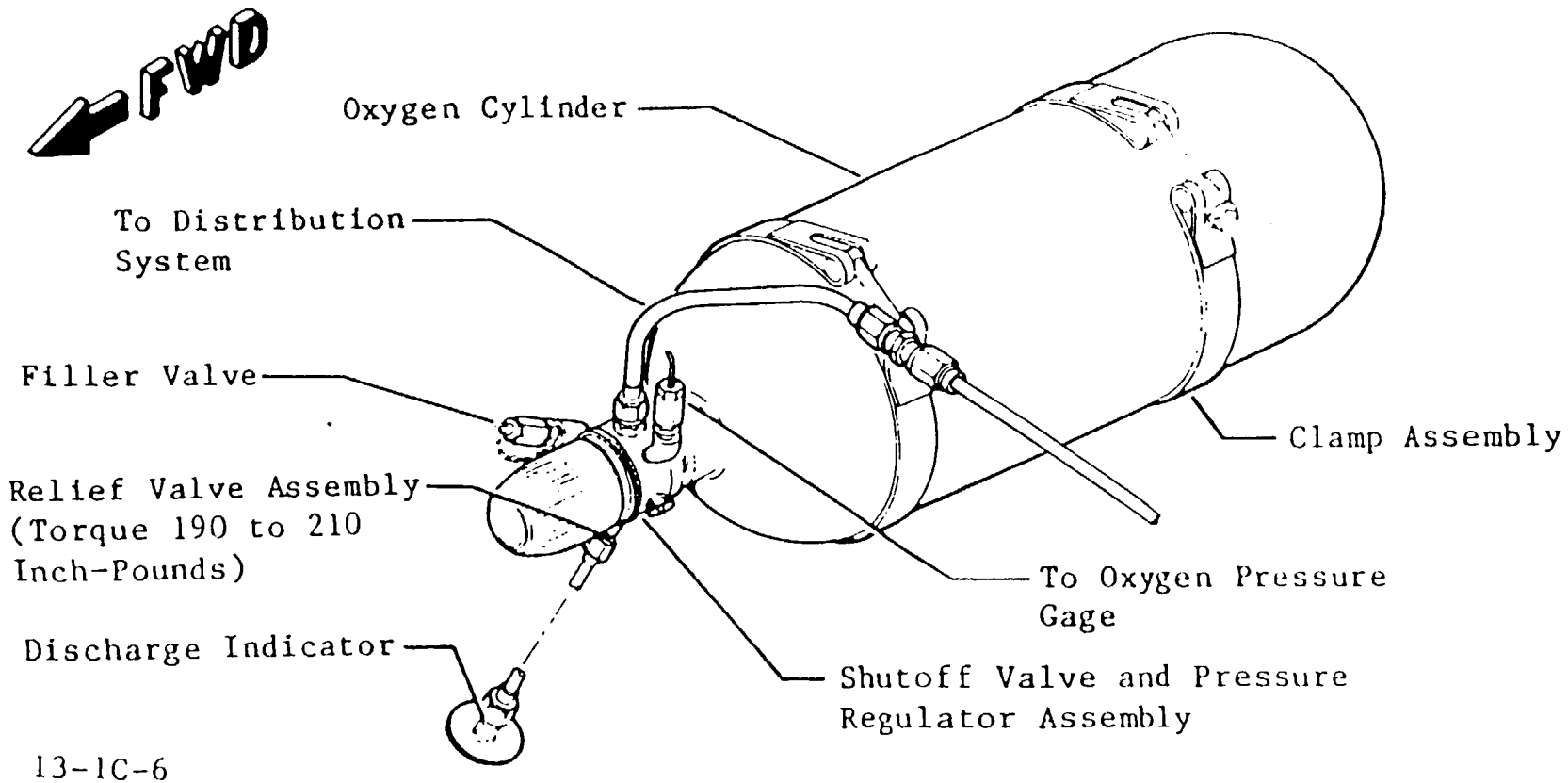
Oxygen storage system

The storage system comprises a 38 cu ft oxygen bottle at a pressure of 1800 psi. The bottle is installed on the right hand side of the nose compartment.



VIEW LOOKING OUTBOARD R.H. SIDE


SEE DETAIL B 9 D
3100010-91 TUBE ASSY
2319133-25 STRAP ASSY (REF)
2319133-39 CHANNEL (REF)
MS21919DG5 CLAMP INSTALL WITH EXISTING SCREWS
12.75
16.00
14.00
.30 (TYP) E.D
TUBE ASSY
TUBE
AN818-5D NUT (2 REQD)
MS20819-5D SLEEVE (2 REQD)
NO. 12 (.189) DIA HOLE
MS21919DG5 CLAMP
AN520-10R8 SCREW
MS21042-3 NUT
(INSTALL CLAMP TO UPPER SIDE OF FLANGE)
2318225 TEE ASSY (REF)
AN832-5D UNION
AN924-5D NUT
MS27513-005 O-RING
MS35489-10S GROMMET
AN815-5D UNION
MS35489-10S GROMMET
3100010-91 TUBE ASSY (REF)
AA
AE
AE 12 C



Nose Compartment Oxygen Cylinder Installation
Figure 201

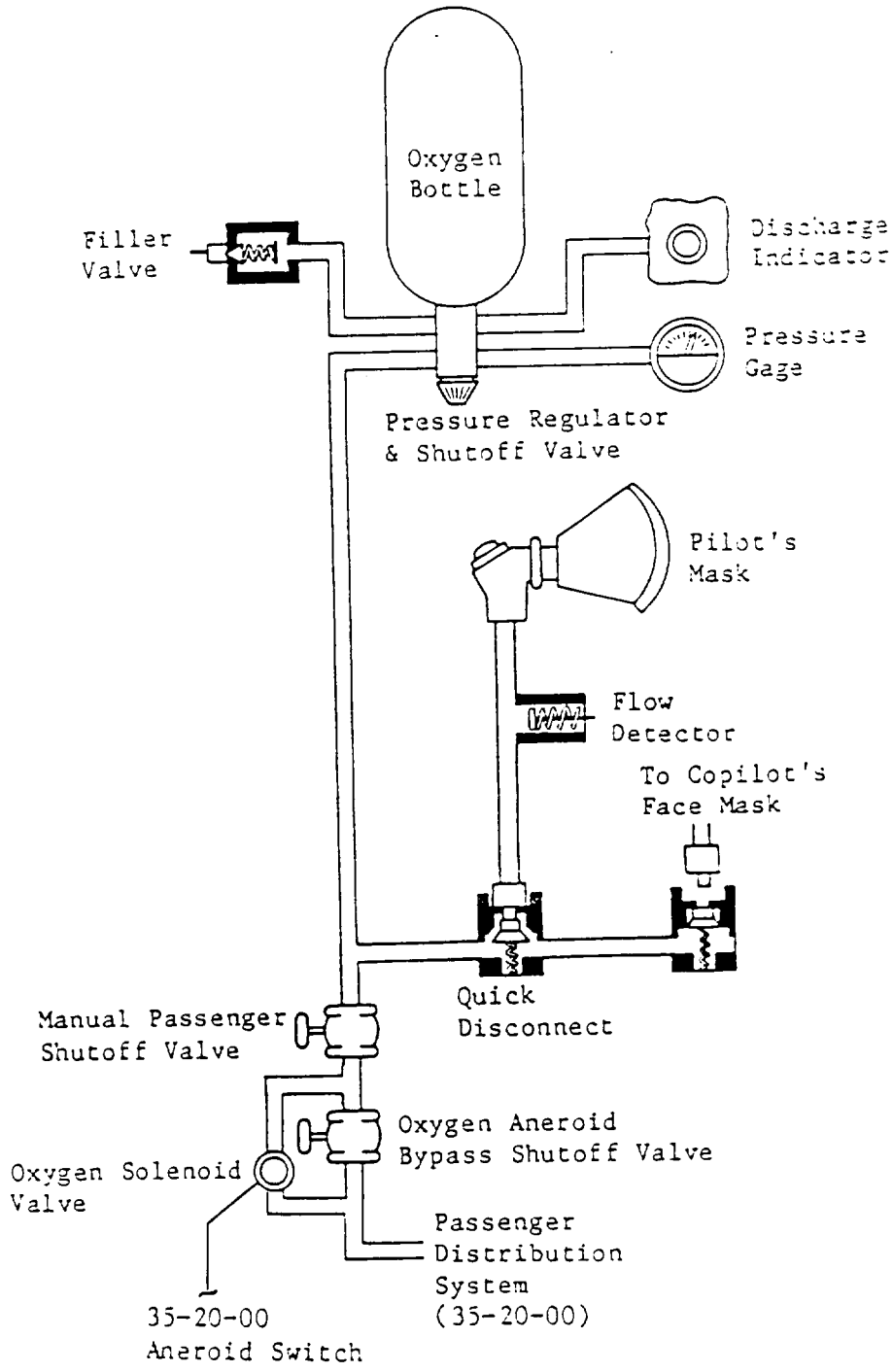
Nose compartment oxygen system

Crew distribution system

Directly supplied by hard line tubing from the oxygen cylinder assy.
Oxygen flow is available at all times.
Crew masks connect to the system by quick disconnects.
Several crew masks are approved for use.

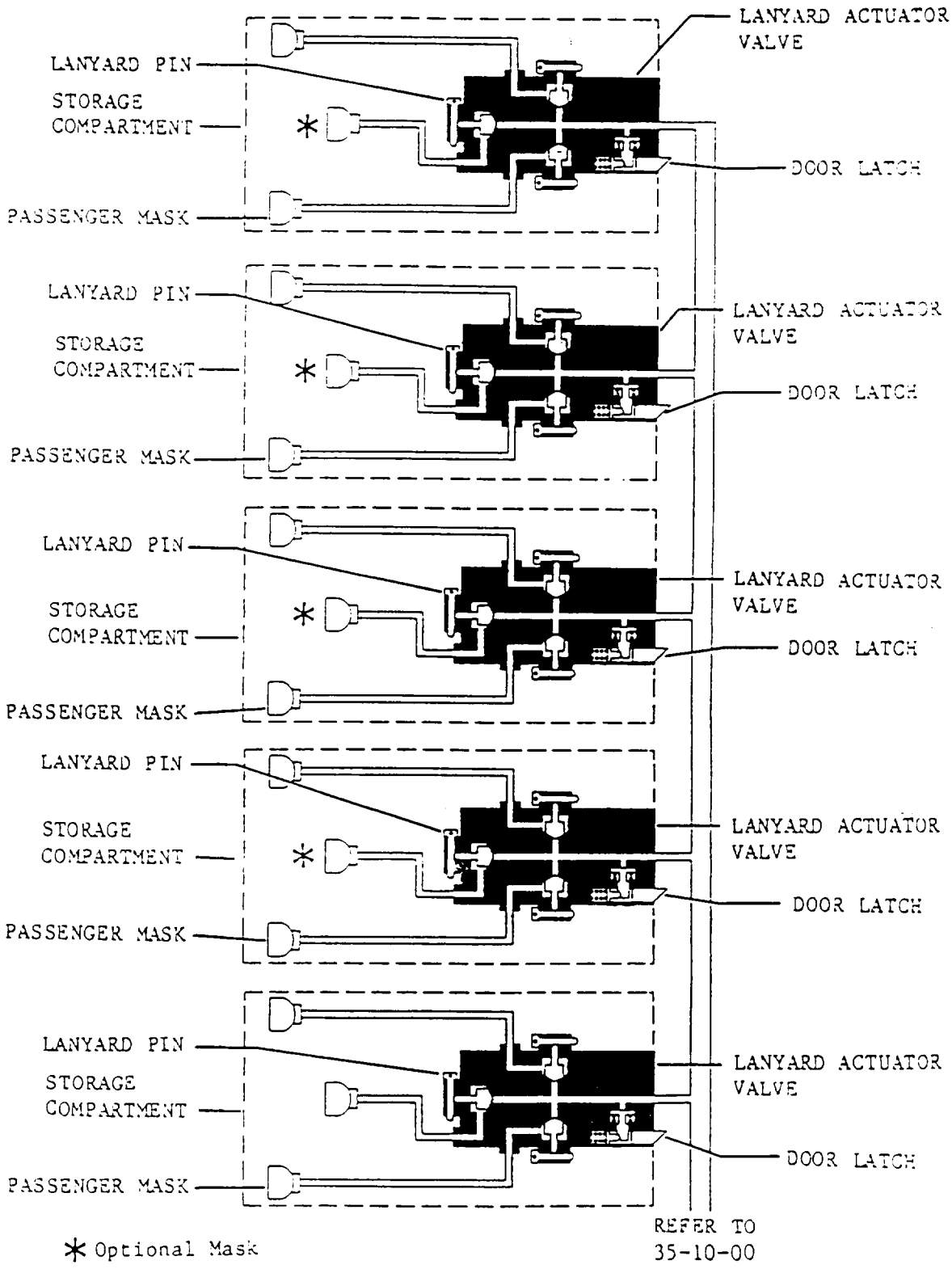
Passenger distribution system

Supplied from downstream of the crew distribution system.
Oxygen flow to the mask storage boxes is initiated either by an aneroid switch or through manual selection by the pilot.
Once the oxygen masks have been deployed, oxygen flow to the masks is accomplished by pulling on the lanyard.
There are 5 storage boxes, eleven masks.



Crew Oxygen System Schematic
Figure 1

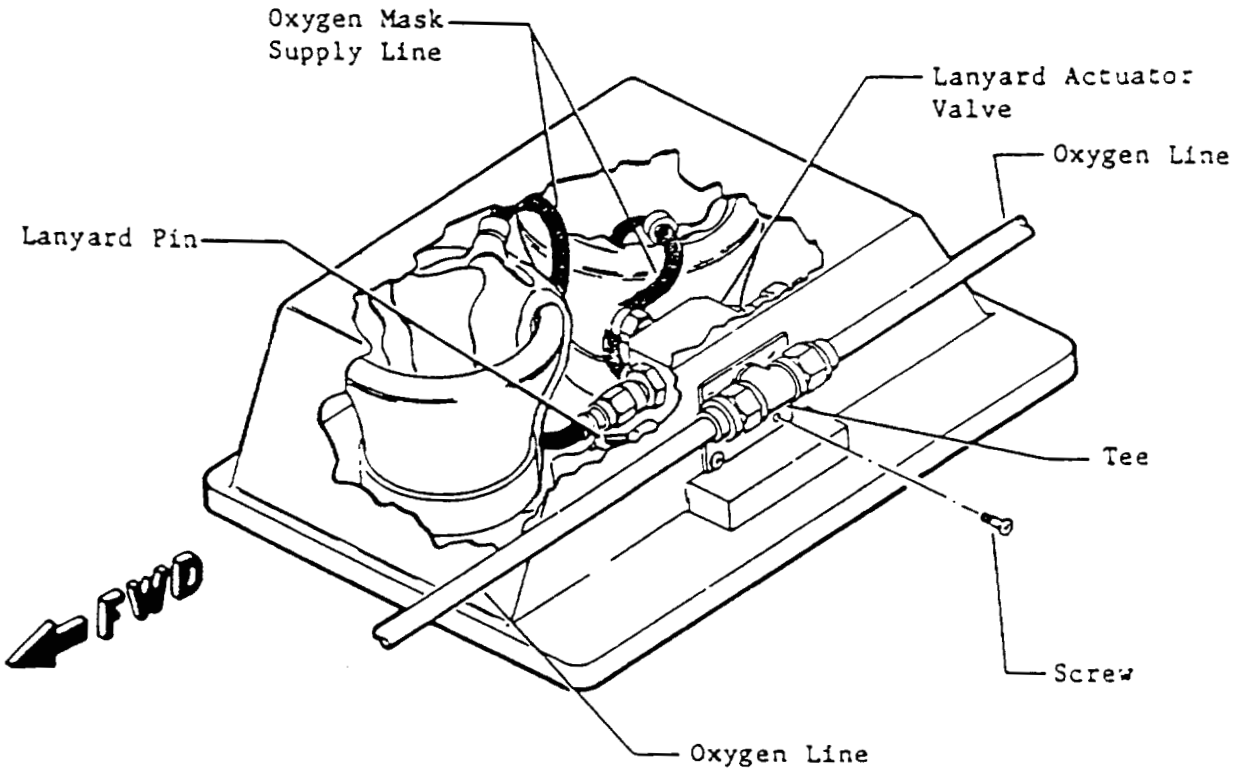
EFFECTIVITY: AIRCRAFT EQUIPPED WITH NOSE OR DORSAL OXYGEN SYSTEM



Passenger Oxygen System Schematic
Figure 3

LANYARD ACTUATOR VALVE - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION
   A. Remove Lanyard Actuator Valve (See figure 201.)
      (1) Lower upper center panel sufficiently to gain access to the storage compartment.
      (2) Disconnect oxygen line from tee. Cap exposed lines.
      (3) Remove tee from storage compartment.
      (4) Release storage compartment door and disconnect oxygen mask from valve.
      (5) Remove attaching parts and valve from storage compartment.
   B. Install Lanyard Actuator Valve (See figure 201.)
      (1) Install valve and secure with attaching parts.
      (2) connect oxygen mask supply lines to outlet port.
      (3) Install mask and door in storage compartment.
      (4) Install tee on storage compartment.
      (5) Connect oxygen lines to tee.
      (6) Install upper center panel and secure.



Lanyard Actuator Valve Installation
Figure 201

Nose compartment oxygen system

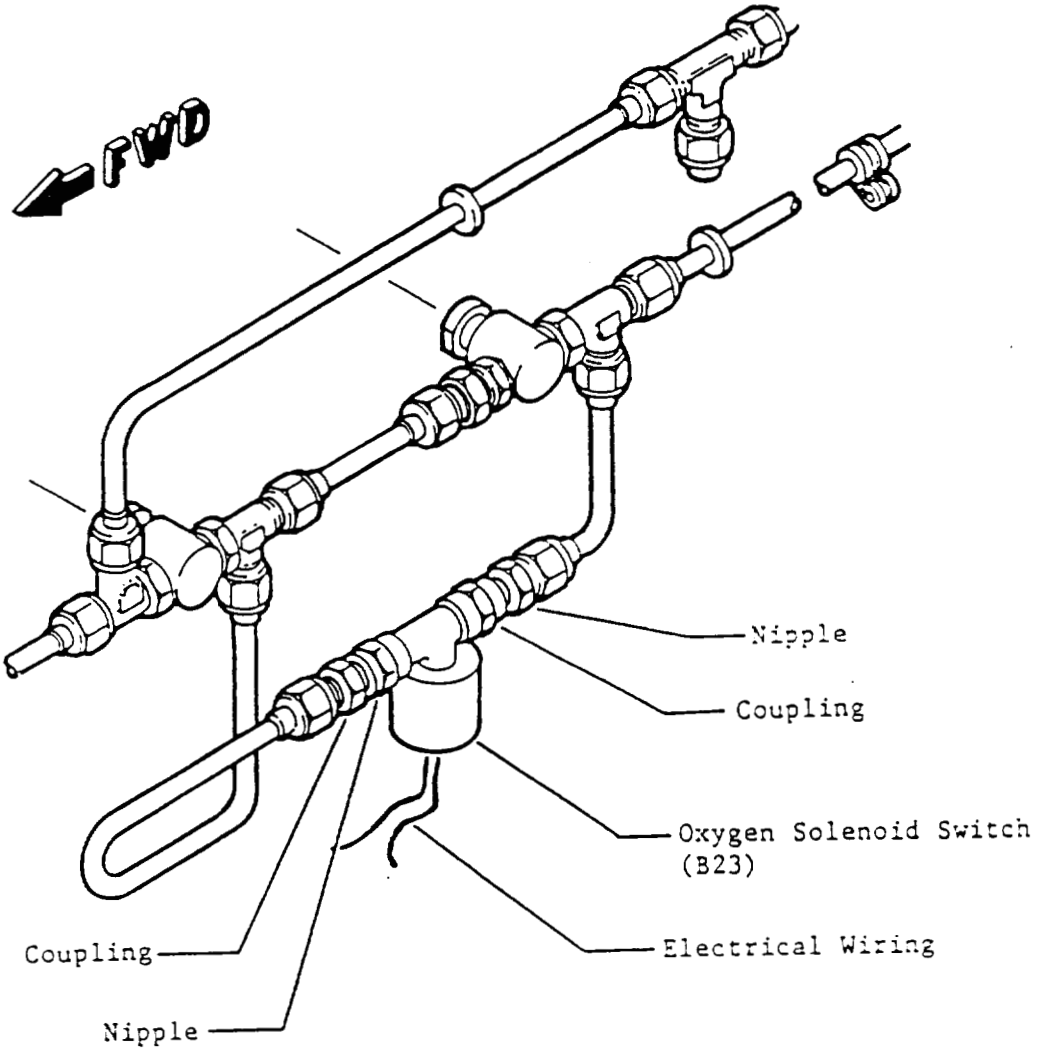
Indication

There is an oxygen gage installed in the upper portion of the co-pilots instrument panel. This gage is plumbed directly from the bottle in the nose and gives a direct reading of oxygen bottle pressure and therefore quantity.

Nose compartment oxygen system

Controls

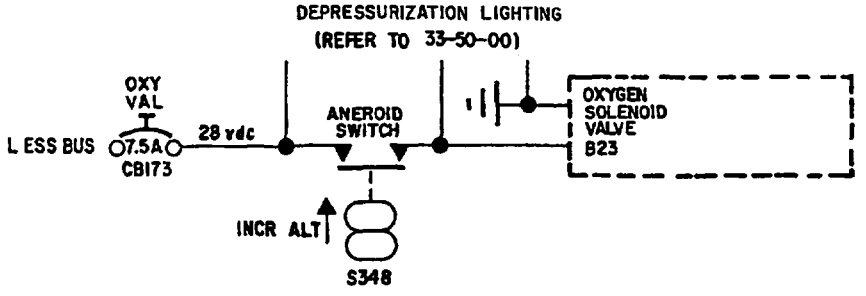
The shutoff valve and pressure regulator assembly form an integral part of the oxygen cylinder assy. The pressure regulator regulates the pressure in the system to between 60 and 80 psi. the shutoff valve allows for isolating the oxygen bottle to prevent leakage from the system during long periods of unuse. When the shutoff valve is closed the oxygen distribution line is vented to ambient.
The passenger oxygen solenoid valve is located on the LH side of the cockpit above the circuit breaker panel and behind the upholstery panels. The solenoid valve is activated by the oxygen aneroid switch to provide oxygen flow to the passenger distribution system
The aneroid switch is located in the pressurized portion of the cabin on frame 5 (pressure bulkhead)
The manual aneroid bypass valve (Pass Mask Valve) is located on the LH side of the cockpit above the circuit breaker panel. The valve (normally closed [Auto]) is installed in a bypass line around the passenger oxygen solenoid valve and must be opened in case of an aneroid switch or solenoid valve malfunction.



TYPICAL INSTALLATION, LH SIDE

Oxygen Solenoid Valve Installation
Figure 201

Learjet



Passenger Oxygen System Electrical Control Schematic
Figure 1 (Sheet 1 of 3)

EFFECTIVITY: AIRCRAFT EQUIPPED WITH NOSE OR DORSAL OXYGEN SYSTEM

MM-99

Nose compartment oxygen system

Safety devices

An overboard discharge indicator is installed on the RH side of the nose approx. F.S. 38.38 it comprises a green blowout disc secured by a snap ring.
The manual passenger oxygen valve (Pass Oxy Valve) is installed on the LH side of the cockpit above the circuit breaker panel. The valve (normally open [Norm]) is installed upstream of the aneroid bypass valve and the oxygen solenoid valve. The manual passenger oxygen valve may be closed to provide oxygen to the crew only.