2A-21-10: General

The Gulfstream V air conditioning system provides a means for the flight crew to accomplish the following:

- Select and control the engine bleed air entering and exiting the Environmental Control System (ECS) packs, as well as maintaining consistent temperature of air exiting the ECS packs. Source air is provided by either external air or APU air while on the ground, or by the aircraft engines to the left and right engine bleed air manifolds. The ECS packs receive the bleed air from the manifold. Through the isolation valve, air from both manifolds can be directed to either ECS pack. This provides a constant mass of conditioned air for the main cabin, cockpit, and avionics areas within the pressure vessel.
- Control, regulate and monitor the amount of air within the pressure vessel to provide the selected cabin pressure (altitude). This is accomplished by modulation of the outflow valve. The outflow valve is automatically controlled by the cabin pressure controller in the normal operating mode, but can be controlled manually.
- Control the temperature of conditioned air delivered to the cockpit, forward cabin, and aft cabin areas within the pressure vessel. This is accomplished by use of the two ECS packs to cool incoming air and deliver it to a common cold air manifold. Three trim air valves modulate the temperature of the air coming from the manifold into the pressure vessel. Indication of any cooling problems within the Left, Right, and Baggage Electronic Equipment Racks (EERs), Left and Right Power Distribution Boxes (PDBs), cockpit Display Units (DUs), and cockpit center pedestal equipment is also provided.

The air conditioning system is divided into the following subsystems:

- 2A-21-20: Pressurization Control System
- 2A-21-30: Airflow and Temperature Control System

2A-21-20: Pressurization System

1. **General Description:**

   The pressurization system controls pressure and air flow to the cockpit and cabin areas of the pressure vessel to ensure maximum passenger comfort and safety.

   Pressurization control is achieved by supplying a constant inflow of air and by regulating the amount of air leaving the aircraft through the outflow valve. A dual-channel Cabin Pressure Controller (CPC) accepts inputs from the flight crew, the Flight Management System (FMS), cabin pressure sensors, and the Micro Air Data Computers (MADCs). The CPC then controls the outflow valve to regulate the rate of climb or descent to control the cabin altitude.

   Major components of the pressurization system are:

   - Cabin Pressure Controller
   - Cabin Pressure Control Panel
   - Cabin Pressure Selector Panel
   - Cabin Pressure Indication System
   - Outflow Valve
   - Pressure Relief Valve

2. Description of Subsystems, Units and Components:

A. Cabin Pressure Controller:

The cabin pressure controller is located in the Right Electronic Equipment Rack (REER). It is designed as a dual-channel unit in that it contains two identical channels. Each channel of the controller contains a microprocessor with an independent power source and an outflow valve motor driver. Only one channel is in control of sensing cabin pressure, and commanding the outflow valve open or closed, at any time. The active channel alternates automatically, changing each time aircraft electrical power is shut off.

The cabin pressure controller provides prompting to display cabin altitude, cabin differential pressure, and rate of climb to the cabin pressure indicator.

The cabin pressure controller has a Built-In-Test (BIT) function in each channel. The BIT provides a cross-check of the measured cabin pressure, MADC inputs, FMS inputs, and discrete inputs. Both channels perform BITs on their outflow valve motor driver. Any faults or failures are prompted for display on the Crew Alerting System (CAS), ECS / PRESS synoptic page, and the Maintenance Data Acquisition Unit (MDAU).

A red CABIN PRESSURE LOW warning message will be displayed on CAS when cabin altitude climbs above a calculated trip point. The trip point depends on the Landing Field Elevation (LFE) selected. The normal trip point (in cruise) is 8,000 feet unless one of the following conditions are met:

- The cabin pressure controller has detected the start of a descent controlled by the FMS.
- The FLIGHT / LANDING switch (cockpit overhead panel) is set to the LANDING position.
- The LFE is greater than 7,500 feet. If the LFE is set between 7,500 feet and 9,500 feet, the trip point is 10,000 feet. If the LFE is set to greater than 9,500 feet, the trip point is 14,500 feet.
- If the cabin pressure control system is in the MANUAL mode, the cabin altitude trip point is:
  - 8,000 feet (aircraft having ASC 112)
  - 10,000 feet (aircraft not having ASC 112)

The cabin pressure controller controls the pressurization system in three operational modes:

(1) AUTO:

The Automatic (AUTO) mode is the normal mode of operation. The FMS is used to provide selected altitude, pressure altitude, corrected barometric pressure, ground speed, and landing field elevation to the active controller channel. In this mode, with all FMS data valid and available, the cabin pressure selector panel, located on the cockpit center pedestal, will display information from the FMS and the cabin pressure controller will automatically control cabin pressure.

(2) SEMI:

The Semi-Automatic (SEMI) mode is used whenever FMS data is not available or is invalid, or at the discretion of the flight crew. In the

SEMI mode, the following data may be entered using the cabin pressure selector panel:

- Aircraft/Cabin Altitude Data (from 0/0 to 60000/8000 feet)
- Landing Field Elevation Data (from -1000 to 15000 feet)
- Barometric Pressure Correction Data (from 28.00 to 31.00 in Hg)
- Cabin Rate of Climb/Descent (from ↑0/0↓ to ↑3300/900↓)

NOTE:

If the active channel becomes inoperative, in either the AUTO or SEMI modes, a blue “CPCS CHNL 1 (or 2) FAIL” advisory message will be displayed on CAS and the remaining channel will automatically take over as the active channel. If both channels should fail, an amber FAULT indicator will illuminate on the cabin pressure control panel and a blue “CPC CHNL 1-2 FAIL” advisory message will be displayed on CAS. This alerts the crew to select the MANUAL mode to take manual control of the outflow valve. During the AUTO and SEMI modes of operation, the manual outflow driver is disabled.

(3) MANUAL:

The MANUAL mode is used to manually control the outflow valve and may be used as a backup method in the event of failure of both channels of the cabin pressure controller. In the MANUAL mode, both channel outflow valve drivers are disabled.

B. Cabin Pressure Control Panel:

The cabin pressure control panel is located on the COP. It provides the flight crew with notification in the event that both channels of the cabin pressure controller fail. It also provides a means for the flight crew to perform and control the following functions:

- Select the AUTO, SEMI or MANUAL modes of operation.
- Select the FLIGHT or LANDING mode of operation.
- Manually position the outflow valve to the open or closed position, or any position between open or closed.
- Monitor the position of the outflow valve and determine its rate of opening or closure.

C. Cabin Pressure Selector Panel:

The cabin pressure selector panel is located on the aft right side of the cockpit center pedestal. Its operation differs based on the mode of operation of the pressurization system:

- With the pressurization system in the AUTO mode, the cabin pressure selector panel Liquid Crystal Displays (LCDs) provide the means to view input data provided by the FMS and MADC, and the selector knobs are disabled. If the input data becomes invalid, the last inputs are retained in memory until the data is changed by the use of the selector knobs.

- With the pressurization system in the SEMI mode, the data is input via the selector setting knobs for the aircraft cruise/cabin altitude, barometric correction, landing field elevation, and the cabin rate of climb/descent. If the landing altitude data is not inputted via the selector knobs, the landing field elevation retained in memory shall be used for computation.

D. Cabin Pressure Indication System:

The cabin pressure indication system consists of the following units and components:

(1) Cabin Pressure Indicator:

The Cabin Pressure Indicator (CPI) is located above the cabin pressure control panel on the COP. It displays the cabin rate of climb/descent, cabin altitude, and cabin differential pressure. During normal operation, cabin pressure information is received from the CPAM and displayed on the CPI. If the CPAM fails, the CPI will receive information from the cabin pressure controller. CPAM data will also be displayed when the pressurization system is in the MANUAL mode.

(2) Cabin Pressure Acquisition Module (CPAM):

The Cabin Pressure Acquisition Module (CPAM) is located on the Right Electronic Equipment Rack (REER). It is a self-contained unit that gathers independent cabin pressure and static pressure data. The CPAM then analyzes the data and provides it to the CPI for display.

E. Outflow Valve:

The outflow valve is located under the lower shelf of the REER. It contains a valve butterfly plate that is positioned by an actuator through the use of an irreversible gear train. The gear train prevents butterfly plate motion except when commanded by one of the three drive motors. Two drive motors are controlled by the cabin pressure controller during AUTO and SEMI modes, and the third is driven by the cabin pressure control panel in the MANUAL mode. The AUTO and SEMI control motors are driven by AC power, and provide feedback to the cabin pressure controller. The MANUAL control motor is driven by DC power.

F. Pressure Relief Valve:

The pressure relief valve is located under the lower shelf of the REER, adjacent to the outflow valve. It provides a rate-limiting function to prevent damage to the aircraft fuselage from excessive positive or negative pressures. This is accomplished by the following means:

- Positive differential pressure relief.
- Negative differential pressure relief.
- Cabin repressurization rate limiting.
- Additional outflow capability during ground operations.

The pressure relief valve provides positive differential pressure relief by venting cabin air through the pressure vessel when a positive differential pressure of 10.48 pounds per square inch differential (psid), or a negative differential pressure of -0.25 psid, is reached. During ground operations

when the outflow valve is full open, the pressure relief valve will open to ensure a minimal differential pressure exists within the pressure vessel.

3. Controls and Indications:

(See Figure 1 through Figure 4.)

A. Circuit Breakers (CBs):

The pressurization system is protected by the following CBs:

Circuit Breaker Name:	CB Panel:	Location:	Power Source:
CAB PRESS CHAN 1	LEER	D-11	ESS AC Bus
CAB PRESS CH 2	REER	D-8	R MN AC Bus
CAB PRESS MAN CONT	LEER	E-8	L ESS DC Bus
CAB PRESS RELIEF VLV	REER	E-10	R MN DC Bus
CAB PRESS IND	REER	E-11	R ESS DC Bus

A. Crew Alerting System (CAS) Messages:

(1) CAS Messages – All GV Aircraft:

CAS Messages associated with the pressurization system are:

Area Monitored:	CAS Message:	Message Color:
CPC / CPAM	CABIN DFRN -10.48	Red
CPC / CPAM	CABIN PRESSURE LOW	Red
CPC / CPAM	CABIN DFRN -10.28	Amber
CPC	CABIN PRESS MANUAL	Amber
CPC	CPCS CONT PNL FAIL	Amber
CPC	CPCS FAIL- SEL MAN	Amber
CPC	CPCS LOW AIR FLOW	Amber
CPAM	CPAM FAIL	Amber
CPC	CAB PRESS SEMIAUTO	Blue
CPC	CPCS 1-2 FAIL	Blue
CPC	CPCS CHNL 1 FAIL	Blue
CPC	CPCS CHNL 2 FAIL	Blue
CPC	CPCS LAND ELEV FL	Blue
CPC	CPCS MAINT REQD	Blue
CPC	CPCS SEL PNL FAULT	Blue
CPC	OUTFLOW VALVE FAULT	Blue

(2) CAS Messages – aircraft Serial Numbers (SN) 550 and subsequent, and SN 501 through 549 with Aircraft Service Change (ASC) 41 incorporated:

Aircraft within this effectivity have a means to advise the flight crew of baggage compartment depressurization through a blue “BAG COMPT LOW PRESS” advisory message displayed on CAS.

A depressurization switch is installed in the baggage compartment to monitor pressurization. If pressurization falls below a preset threshold, the switch closes, completing a ground circuit, resulting in a discrete to Fault Warning Computers (FWCs) 1 and 2. From FWCs 1 and 2, a discrete is then sent to prompt the message for

display.

4. Limitations:

A. Flight Manual Limitations:

(1) Cabin Pressurization Control:

(a) Maximum cabin pressure differential permitted is 10.48 psi.

(b) Maximum cabin pressure differential permitted for taxi, takeoff or landing is 0.3 psi.

(2) Internal Baggage Door:

(a) General:

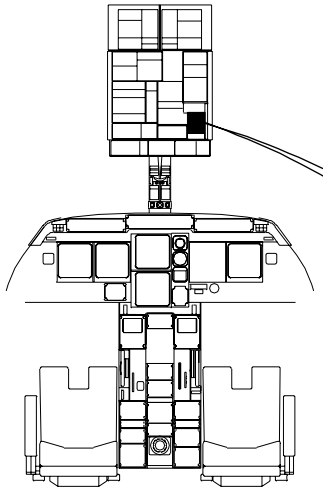
The internal baggage door shall remain closed above 40,000 feet. Access to the baggage compartment above 40,000 feet is permitted provided the door is closed after exiting the compartment.

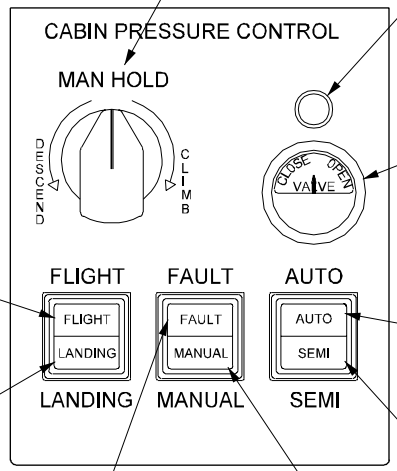
(b) If Operating on a Single ECS Pack:

If operating on a single ECS pack, access to the baggage compartment is allowed only at or below 45,000 feet.

(c) When Above 40,000 Feet:

Time with the internal baggage door open above 40,000 feet is limited to five (5) minutes. The flight crew is required to ensure that door is closed and message extinguished within five (5) minutes when above 40,000 feet.





MAN HOLD
In MANUAL mode, provides DC motor control of Outflow Valve position. When knob is released, it returns it to a spring-loaded center position. Outflow Valve remains in the position last selected.

MOTOR POWER INDICATOR
Flashes amber when MAN HOLD knob is rotated. Frequency of flashes is proportional to valve opening or closing speed.

VALVE POSITION INDICATOR
Pointer moves to indicate outflow valve butterfly position. Functional in all modes of operation.

FLIGHT
(Green) Allows automatic pressurization of aircraft on the ground to 500 feet below takeoff field elevation if ground speed is greater than eight knots, or if power levers are advanced to takeoff power.

AUTO
(Green) Automatic (Normal operating) mode. FMS data supplied to the Cabin Pressure Controller is used to position Outflow Valve.

LANDING
(Green) Indicates automatic or manual descent schedule has been selected. During ground operations in AUTO or SEMI modes, selection opens Outflow Valve.

FAULT
(Amber) When a fault is sensed by the Cabin Pressure Controller, or both Controller channels fail, the AUTO (or SEMI) legend will be extinguished in the AUTO / SEMI switch and the FAULT legend in the FAULT / MANUAL switch will illuminate. Crew action is required to select switch.

MANUAL
(Amber) Selection of the FAULT / MANUAL switch causes the FAULT legend to extinguish and the MANUAL legend to illuminate. The system is now in the MANUAL mode.

SEMI
(Green) Semi-automatic mode. Cabin Pressure Selector panel knobs are activated. Data entered in the Selector panel is used to position Outflow Valve.

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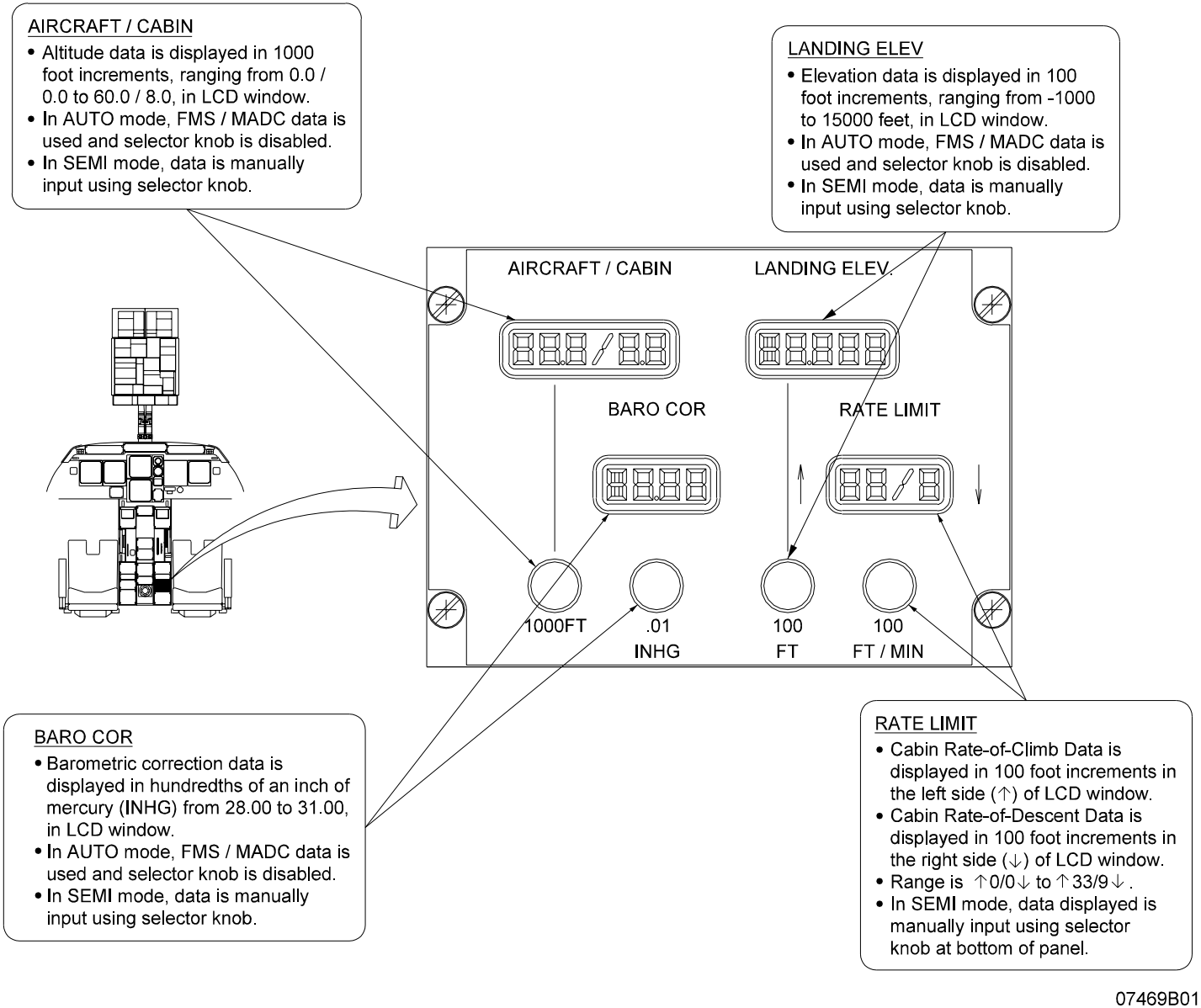
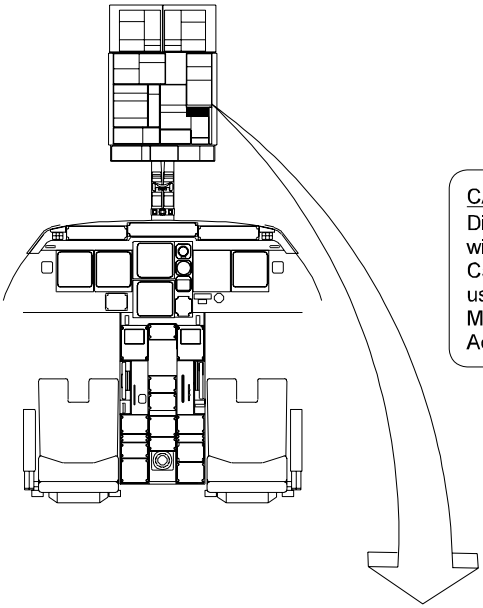
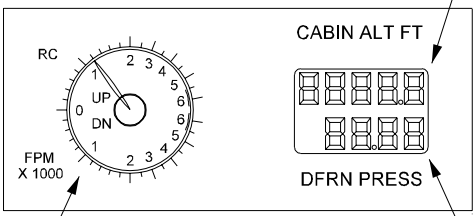
Cabin Pressure Control Panel
Figure 1



Cabin Pressure Selector Panel
Figure 2



CABIN ALT FT
Displays cabin altitude in LCD window. In AUTO or SEMI mode, Cabin Pressure Controller data is used. If controller fails, or if in MANUAL mode, Cabin Pressure Acquisition Module data is used.



RATE-OF-CHANGE (RC)
Displays cabin rate-of-climb (UP) and cabin rate-of-descent (DN). Display is in thousands of feet per minute (FPM X 1000) to 6000 FPM UP or DN. In AUTO or SEMI mode, Cabin Pressure Controller data is used. If controller fails, or if in MANUAL mode, Cabin Pressure Acquisition Module data is used.

DFRN PRESS
Displays cabin differential pressure in LCD window. In AUTO or SEMI mode, Cabin Pressure Controller data is used. If controller fails, or if in MANUAL mode, Cabin Pressure Acquisition Module data is used.

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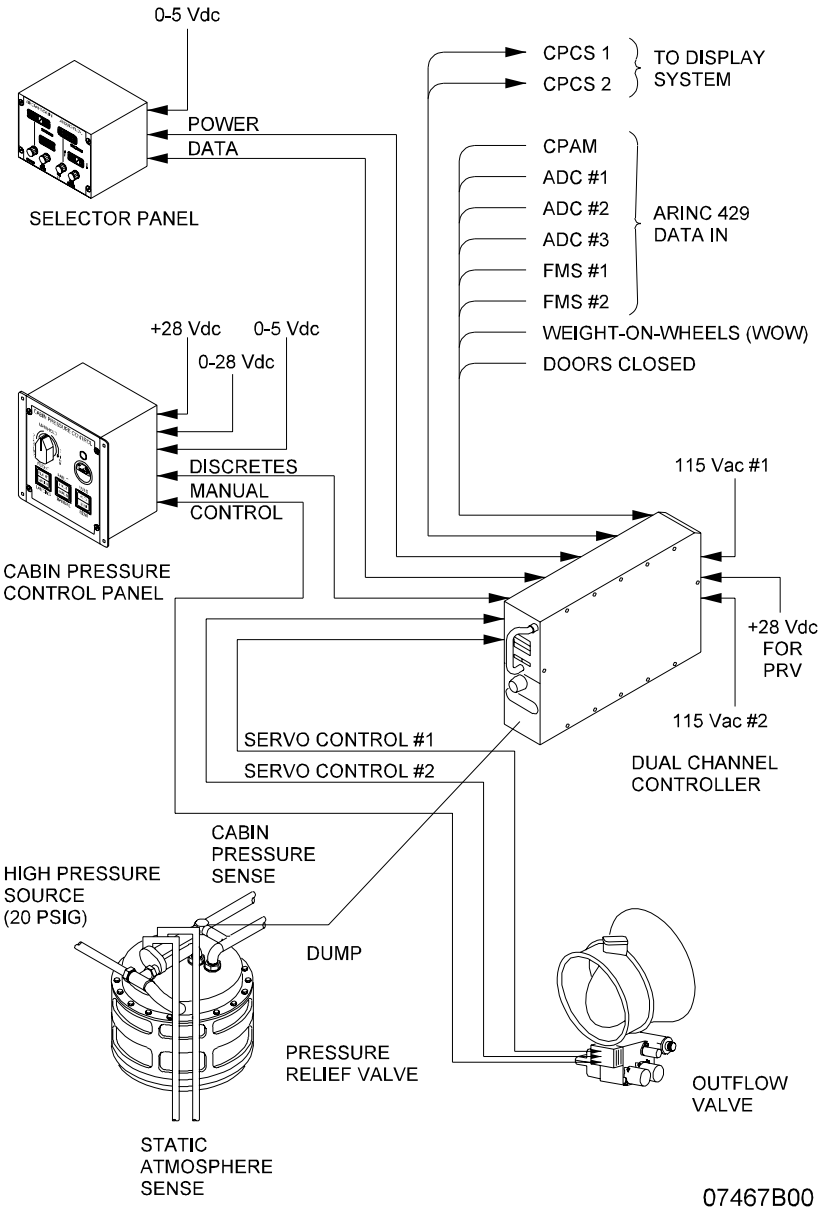
Cabin Pressure Indicator Panel
Figure 3



Pressurization System Simplified Block Diagram
Figure 4

2A-21-30: Airflow and Temperature Control System

1. General Description:

The airflow and temperature control system provides the flight crew with a means to select and control the engine bleed air entering and exiting the Environmental Control System (ECS) packs, as well as maintaining consistent temperature of air exiting the ECS packs. A means for the flight crew to control the temperature of conditioned air delivered to the cockpit, forward cabin, and aft cabin areas within the pressure vessel is also provided. On airplanes not having the provisions of Aircraft Service Change (ASC) 85 incorporated, ECS cooling air is supplied to augment fan air for the left and right Electronic Equipment Racks (EERs) when above 35,000 feet. The left and right Power Distribution Boxes (PDBs), aft baggage compartment EER, cockpit Display Units (DUs), and cockpit center pedestal equipment are cooled by incorporated fans.

The airflow and temperature control system is divided into the following subsystems:

- Airflow Control Subsystem
- Cabin / Cockpit Temperature Control Subsystem
- Equipment Cooling Subsystem

2. Description of Subsystems, Units and Components:

A. Airflow Control Subsystem:

The airflow control subsystem provides the flight crew with a means to select and control the engine bleed air entering and exiting the ECS packs. Units and components that compose this subsystem are:

(1) Air Conditioning Controllers:

The Air Conditioning Controllers (ACCs) are mounted in the aft Electronic Equipment Rack (EER). The left and right ACCs are dedicated to the control of the respective ECS packs, but also assist in the control of the cabin and cockpit temperature zones.

The ECS pack control portion of each ACC provides control and regulation of the amount of bleed air entering the ECS pack inlet valve and exiting the ECS pack. If one ECS pack is commanded OFF, the remaining system flow schedule is automatically increased to the maximum possible without exceeding compressor discharge temperature limits.

(2) Temperature Control Panel:

The temperature control panel is located on the Cockpit Overhead Panel (COP), and is labeled TEMP CONTROL. The L PACK, R PACK and RAM AIR switches provide the flight crew with a means to control air entry into the left and right ECS pack, and the actual operation of the packs. Conditioned airflow into the cockpit can be controlled by the flight crew through the use of the COCKPIT AIRFLOW switch.

(3) Engine Start Control Panel:

The engine start control panel is also located on the COP and is labeled ENGINE START. Through selection of switches found on this panel, the flight crew is provided with an automatic ECS pack shutdown feature. This feature is provided to prevent a larger, more

noticeable cabin pressure fluctuation during engine starting by initiating two smaller, less noticable fluctuations.

During engine starting on the ground, the right ECS pack is shut down when the MASTER START or MASTER CRANK switches are selected. Next, the left ECS pack shuts down when either the L / R ENG START switch is selected or the left or right Starter Air Valve (SAV) relay is energized. Once the left or right engine SAV has completed the engine starting function, left ECS pack operation will be reinstated. Finally, after the MASTER START or MASTER CRANK switch is deselected, right ECS pack operation will be reinstated. As each pack shuts down during engine start, the associated switch OFF legend will be displayed. The legend will remain illuminated until operation of the associated ECS pack resumes.

(4) Aft Baggage Compartment Ventilation Controls:

(a) Aft Baggage Compartment Vent Valve:

This valve automatically closes to isolate the conditioned air flow to the baggage compartment EER cooling ducts. Isolation will occur when the internal baggage compartment door is closed and a pressure differential between the cabin and the baggage compartment is detected.

(b) Baggage Compartment Vent Valve Reset Switch:

Located on the forward (cabin) side of the secondary pressure bulkhead wall, selection of this switch to the RESET position energizes a solenoid that opens the vent valve, restoring airflow to the baggage compartment area.

B. Cabin / Cockpit Temperature Control Subsystem:

The cabin / cockpit temperature control subsystem provides a means for the flight crew to control the temperature of conditioned air delivered to the cockpit, forward cabin, and aft cabin areas within the pressure vessel. Units and components that compose this subsystem are:

(1) Air Conditioning Packs:

The GV is equipped with two identical air conditioning packs, commonly referred to as ECS packs. The ECS pack takes in high pressure, high temperature bleed air regulated by the ECS pack inlet valve. After having been cooled, conditioned and dehumidified, by the ECS pack, the air is discharged to a common cold air manifold. From the cold air manifold, the air is available for delivery to the individual outlets and overhead gaspers. On airplanes not having the provisions of ASC 85 incorporated, ECS cooling air is also supplied to augment fan air for the left and right Electronic Equipment Racks (EERs) when above 35,000 feet.

(2) Air Conditioning Controllers:

The Air Conditioning Controller (ACC) controls the associated ECS pack discharge air temperature and prevents ice accumulation inside the pack by monitoring the compressor inlet and compressor outlet temperature. Each ACC also monitors interconnecting components of the system for overall system health. Any faults or failures are prompted for display on CAS, ECS / PRESS synoptic

page, and/or stored in the Maintenance Data Acquisition Unit (MDAU).

(3) Temperature Control Panel:

In addition to the functions provided for airflow control, the TEMP CONTROL panel provides the flight crew with a means to select temperature display on or off using the AUTO TEMP SELECT switch, and to select zone or duct temperatures for display using the TEMP DISPLAY switch.

(4) Temperature Display Panel:

The temperature display panel is located on the COP beneath the TEMP CONTROL panel, and is labeled TEMP DISPLAY °F. Each zone (labeled COCKPIT, FWD CAB and AFT CAB) has a Liquid Crystal Display (LCD) indicator to display temperature, an AUTO / MAN switch to select the mode of operation, and a COLD / HOT rheostat (control knob) to adjust the temperature as necessary.

(5) Zone Delivery Ducts:

In addition to the EER cooling and overhead gasper ducts, three zone (Cockpit, Forward Cabin and Aft Cabin) delivery ducts also receive cold air from the cold air manifold. Each zone duct is connected to a common hot air manifold, but isolated by a trim air valve. Selective opening of the trim air valve through the use of cockpit controls permits mixing of cold and hot air to achieve different comfort levels in the three zones.

Various sensors, control valves, and thermostats are installed in the zone delivery ducts to provide optimum performance while at the same time protecting against potential damaging conditions such as overheating or overcooling. Any faults or failures are prompted for display on CAS, ECS / PRESS synoptic page, and/or stored in the Maintenance Data Acquisition Unit (MDAU). (On airplanes having ASC 85A incorporated, a second cockpit zone temperature sensor has also been installed.)

C. Equipment Cooling Subsystem:

Cooling air, in the form of ECS pack air and/or fan-generated air, is provided to the following components by the Equipment Cooling subsystem:

- Electronic Equipment Racks (EERs): Left (LEER), Right (REER), and Aft EER.
- Left and Right Power Distribution Boxes (PDBs)
- Personal Services Unit (PSU)
- Display Units (DUs)
- Cockpit Center Pedestal

This subsystem is divided as follows:

(1) LEER and REER Cooling:

The LEER and REER each contain an electrically-powered, two-speed cooling fan. Below 35,000 feet, the fans operate at high speed. Above 35,000 feet, the ACC directs a signal to shift the fans to low speed and to supply cold air manifold air to the LEER and

REER, supplementing the fan air (airplanes not having the provisions of ASC 85 incorporated). The REER fan also aids in cooling the Transformer-Rectifier Units (TRUs). The LEER and REER fans are monitored for failure. Any failures are detected and prompted for display on CAS.

(2) PSU Cooling:

The PSU contains an electrically-powered, two-speed cooling fan. Below 35,000 feet, the fan operates at low speed. Above 35,000 feet, the ACC directs a signal to shift the fans to high speed. The PSU fan also aids in cooling the TRUs. The fan is monitored for failure. Any failures are detected and prompted for display on CAS.

(3) Aft EER and PDB Cooling:

The Aft EER, left PDB and right PDB each contain an electrically-powered, single-speed cooling fan. The fans are operable any time the appropriate electrical busses are receiving power and the circuit breakers (CBs) are closed. The fans are monitored for failure. Any failures are detected and prompted for display on CAS.

(4) DU and Pedestal Cooling:

Three electrically-powered, single-speed fans are provided for cooling air: two for the DUs and one for the pedestal. The pedestal fan operates any time the appropriate electrical busses are receiving power and the circuit breakers (CBs) are closed. The DU fans operate when the DUs are operating: one fan provides cooling air for DUs 1, 3 and 5, while the other fan provides cooling air for DUs 2, 4 and 6.

3. Controls and Indications:

(See Figure 5 through Figure 10.)

NOTE:

For a detailed description of the ECS / PRESS synoptic page, see Section 2B-03-30: Crew Alerting System description.

A. Circuit Breakers:

The airflow and temperature control system is protected by the following Circuit Breakers (CBs):

Circuit Breaker Name:	CB Panel:	Location:	Power Source:
L PACK CONT	LEER	D-10	L ESS DC Bus
R PACK CONT	REER	D-9	R MN DC Bus
FWD CABIN SENSOR FAN	LEER	D-9	L ESS DC Bus
CKPT SENSOR FAN	REER	D-10	R MN DC Bus
L EER FAN	LEER	D-8	L MN DC Bus
R EER FAN	LEER	D-7	L MN DC Bus
AFT BAGG VENT VLV	LEER	D-6	L ESS DC Bus
CAB AUTO TEMP	LEER	E-11	L ESS DC Bus
CKPT AUTO TEMP	REER	E-8	R MN DC Bus
AFT CABIN SENSOR FAN	LEER	E-9	L ESS DC Bus

Circuit Breaker Name:	CB Panel:	Location:	Power Source:
CAB MAN TEMP	LEER	F-11	L MN DC Bus
CKPT MAN TEMP	REER	F-8	R ESS DC Bus
L PDB FAN	LEER	F-10	L MN DC Bus
R PDB FAN	REER	F-9	R MN DC Bus
AFT EQ FAN	LEER	F-8	L MN DC Bus
CKPT AIR-FLOW CONT VLV	REER	F-10	R MN DC Bus
L PSU FAN	LEER	F-7	L MN DC Bus
PED FAN	LEER	K-9	L MN DC Bus
DISPLAY FAN # 1	LEER	K-10	L ESS DC Bus
DISPLAY FAN # 2	REER	F-1	R ESS DC Bus

A. Crew Alerting System (CAS) Messages:

CAS Messages associated with the airflow and temperature control system are:

Area Monitored:	CAS Message:	Message Color:
L/R COOLING TURBINE	L-R COOL TURB HOT	Amber
L/R ECS PACK	35K ALT TRIP FAIL	Amber
L/R ACC	L-R ACS FAIL	Amber
R ACC	SEL MAN TEMP (C)-F-A	Amber
L ACC	SEL MAN TEMP C-(F)-A	Amber
L ACC	SEL MAN TEMP C-F-(A)	Amber
L/R CRT MODULE	DU FAN 1-2 FAIL	Amber
PED FAN LSWD	PED FAN FAIL	Blue
AFT CAB TMP FAN LSWD	AFT CAB TMP FAN FAIL	Blue
CKPT TEMP FAN LSWD	CKPT TEMP FAN FAIL	Blue
FWD CAB TMP FAN LSWD	FWD CAB TMP FAN FL	Blue
L/R ACC	L-R ACS DEFLT MODE	Blue
L/R ACC	L-R ACS MAINT REQD	Blue
AFT EQ FAN LSWD	AFT EQUIP FAN FAIL	Blue
L PSU FAN MODULE	L PSU FAN FAIL	Blue
L/R EER FAN MODULE	L-R EER FAN FAIL	Blue
L/R PDB LSWD	L-R PDB FAN FAIL	Blue

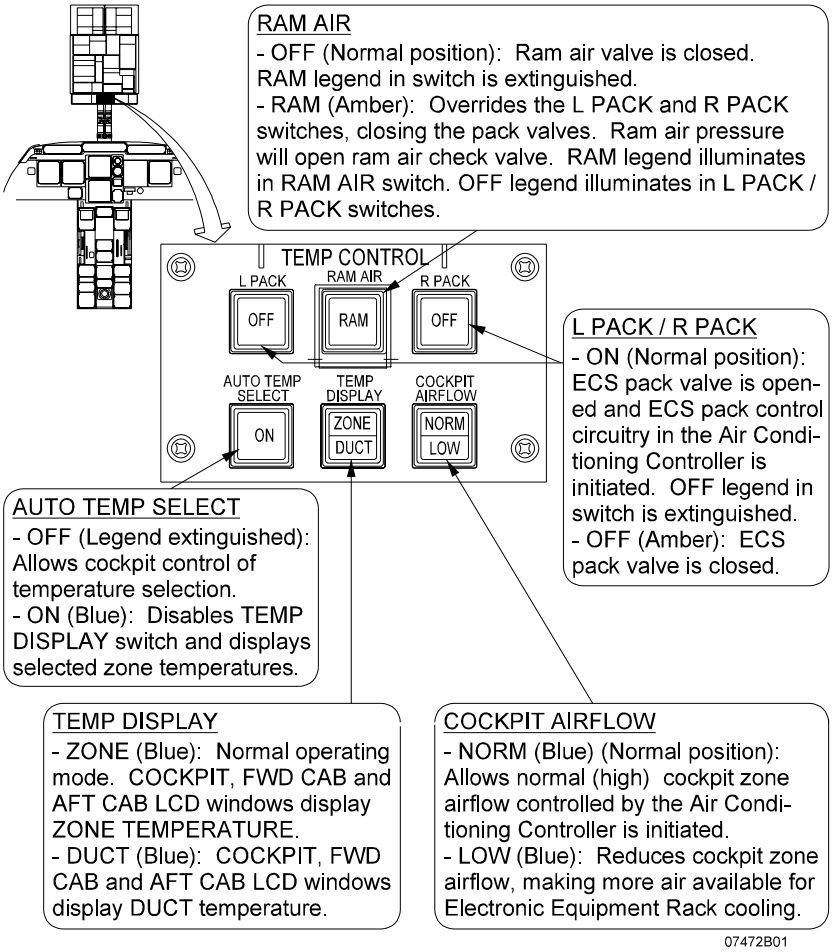
NOTE:

LSWD is an abbreviation for Low Speed Warning Device.

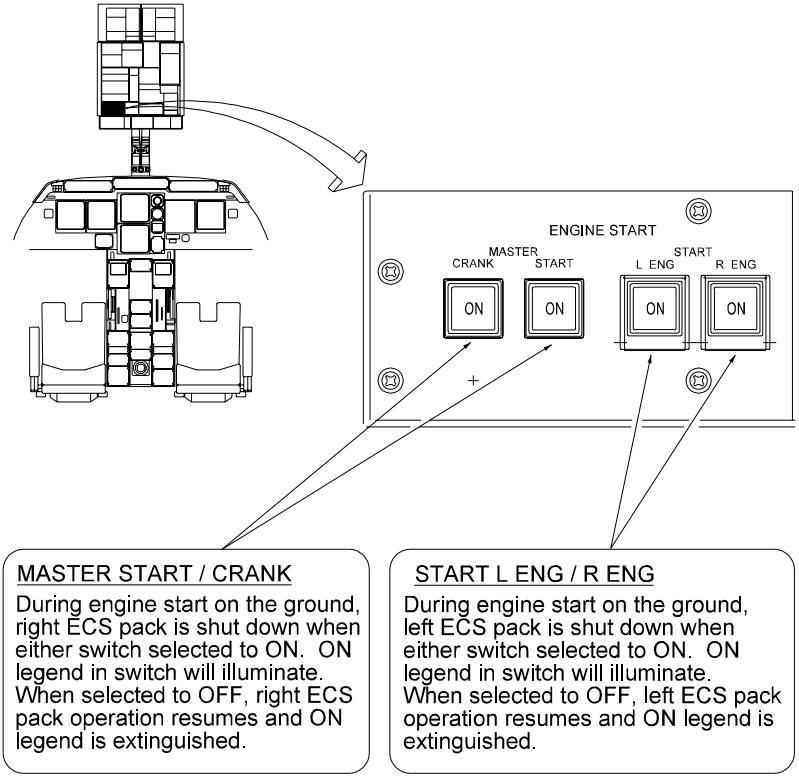
4. Limitations:

A. Flight Manual Limitations:

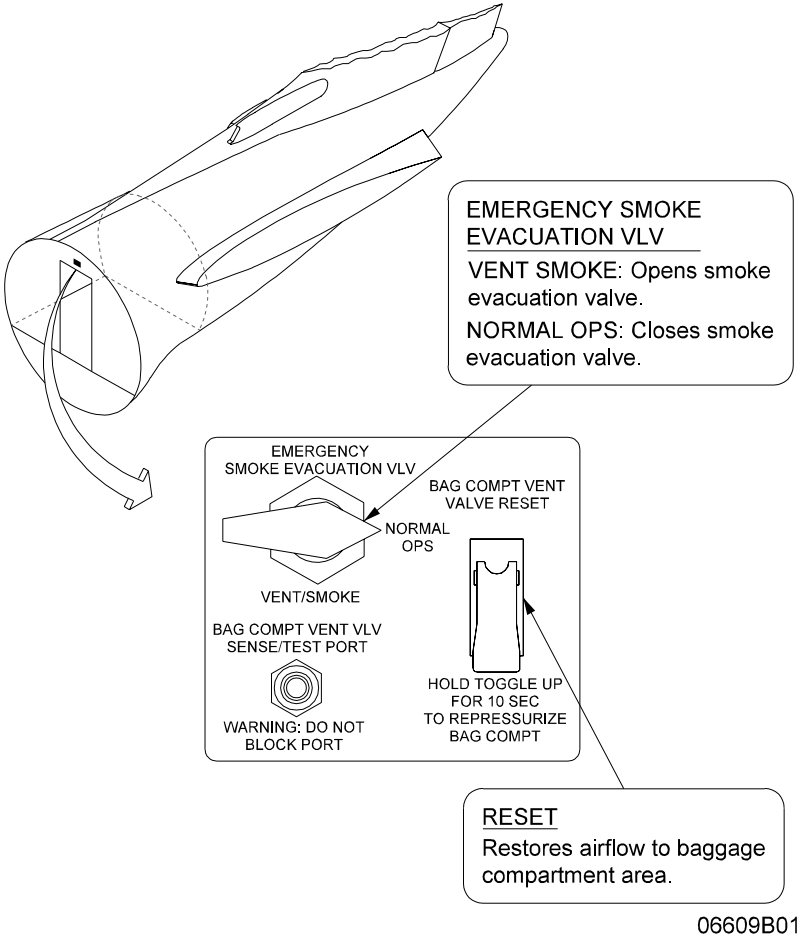
There are no limitations established for the airflow and temperature control system at the time of this revision.



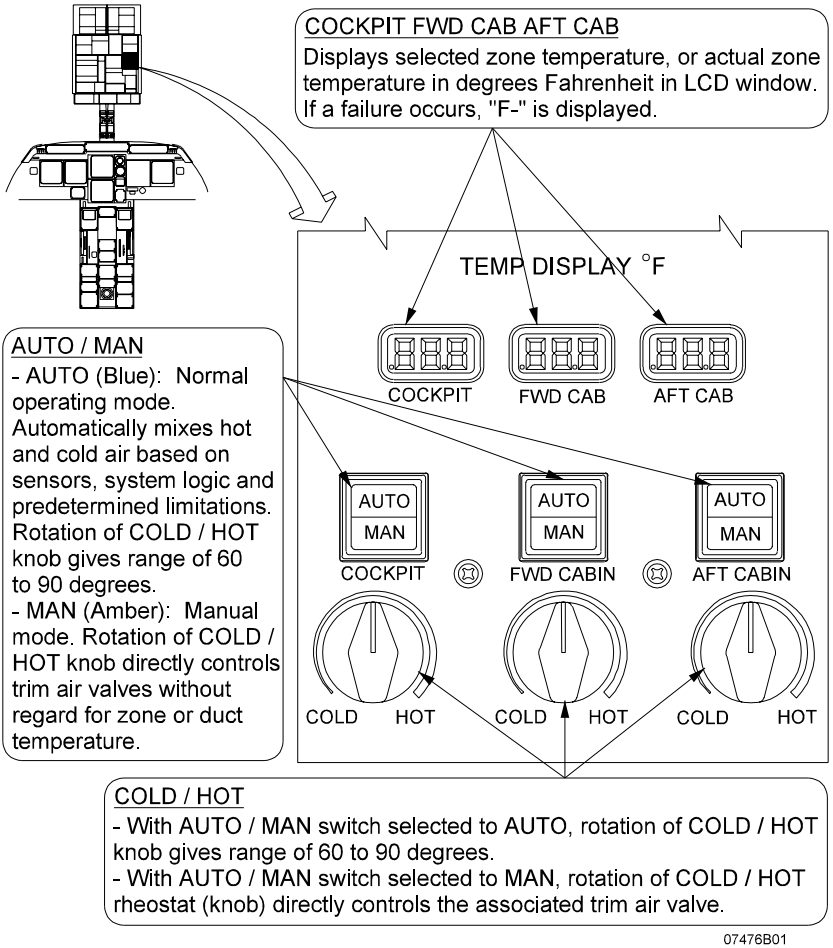
Temperature Control Panel
Figure 5



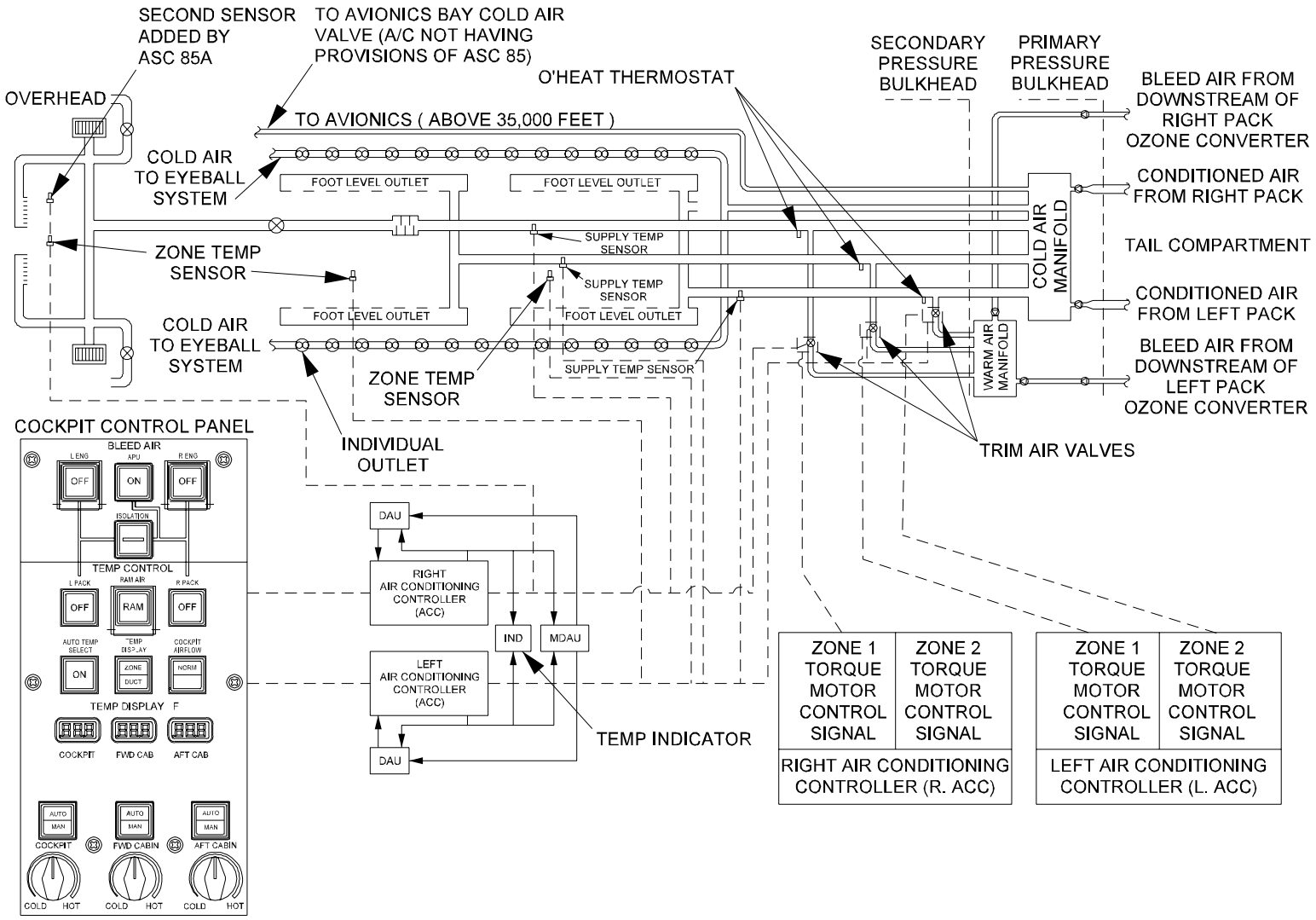
Engine Start Control Panel
Figure 6



Baggage Compartment Vent Valve Reset Switch
Figure 7



Temperature Display Panel
Figure 8



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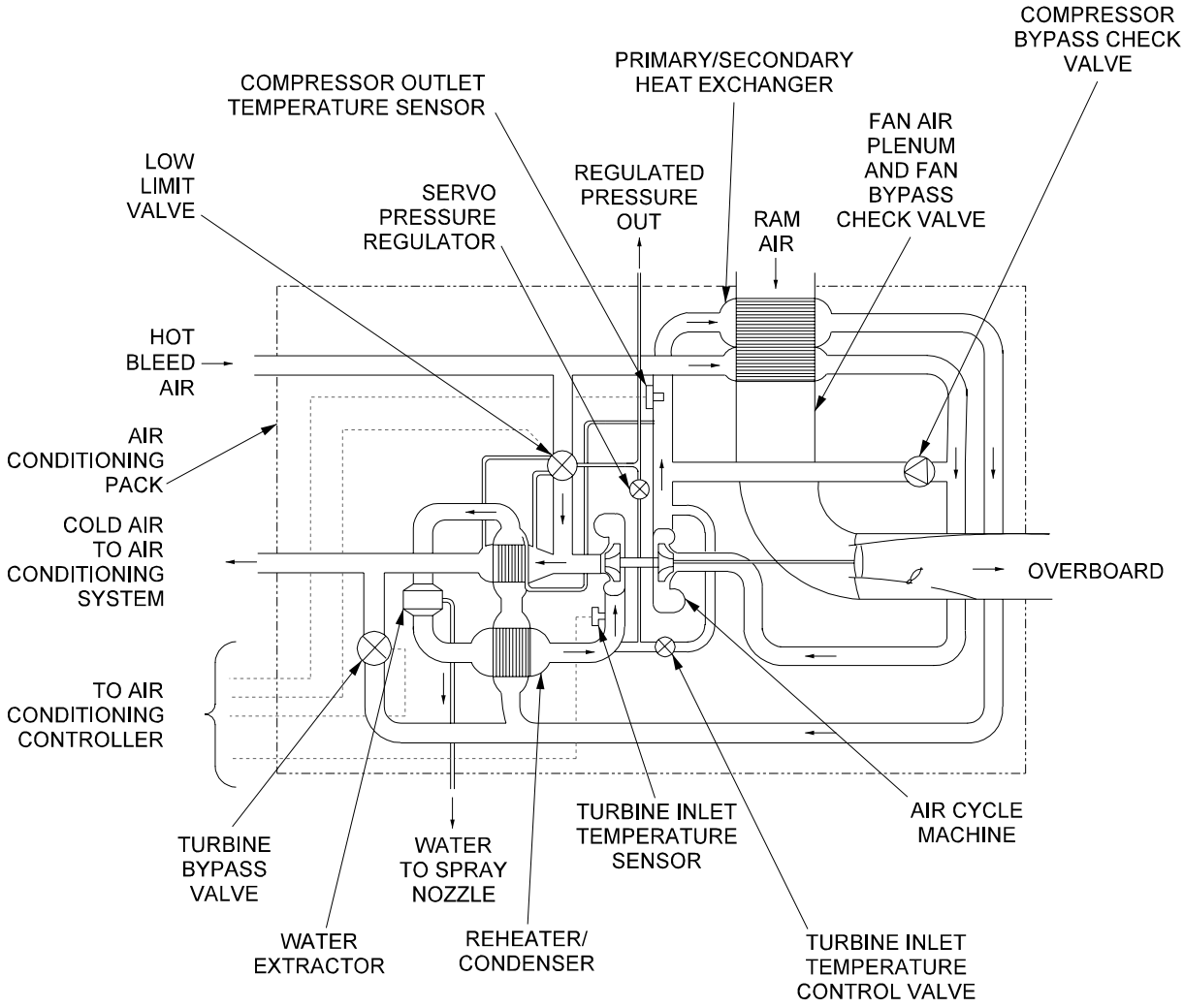
Airflow and Temperature Control System Simplified Block Diagram
Figure 9



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ECS Pack Simplified
Block Diagram
Figure 10