CHAPTER 3

AIR CONDITIONING AND PRESSURIZATION

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CHAPTER 3 AIR CONDITIONING AND PRESSURISATION

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AIR CONDITIONING AND PRESSURIZATION

CHAPTER 3

General

The aircraft has a Environmental Control System (ECS) installed. The ECS supplies all the necessary heating, cooling and ventilation for the aircraft. The passenger cabin and flight deck temperatures are set independently from controls on the flight deck. Air for cabin air conditioning and pressurization is provided by engine High Pressure (HP) and Low Pressure (LP) bleed air. Bleed air from both engines is independently regulated for pressure and flow then ducted to two Air Conditioning Packs (ACP) in the forward end of the ventral pod.

Each ACP conditions the bleed air to the correct temperature, pressure and humidity for distribution. Conditioned air is distributed along the length of the passenger cabin, and to the flight deck at each pilots station.

The aircraft also has a Vapour Cycle Air-Conditioning System and a Recirculation Fan.

The Vapour Cycle Air-Condition System operates together with the ECS to provide the required cooling of the cabin and the flight compartment. The Recirculation Fan recirculates the air in the cabin to provide airflow to the ECS punkah louvre outlets when the ECS is not operating

1. Air Conditioning

   A. Compression System

   The Pressure Regulating and Shut-Off Valve (PRSOV) installed in each engine nacelle, receives engine bleed air, at high temperature and pressure, from either:

   - The High Pressure (HP) bleed port, through the HP Shut-Off Valve (HPSOV), or
   - The Low Pressure (LP) bleed port, through the LP Non-Return Valve (LP NRV).

   HP bleed air is only available when the aircraft is on the ground. When the engine CONDITION lever is at TAXI, a microswitch on the CONDITION lever quadrant energises a solenoid to open the HPSOV. At this point the HP bleed air will close the LPNRV. When the CONDITION lever is moved forward of the TAXI position the microswitch power supply to the solenoid is removed, the HPSOV closes and the LP bleed air opens the LPNRV. The maximum amount of engine air used by the system is 7% LP or 12% HP, no bleed air is available during the engine start sequence.

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The PRSOV controls the bleed air to a maximum of 33 psi (±3). This air then flows through a flow-limiting venturi, out of the engine nacelle and into the ACP.

HP bleed air also supplies:

- Cabin Pressurization Control System (CPCS)
- Airframe de-ice system
- Passenger door seal inflation system
- Hydraulic tank pressurization.

The air for these systems is taken from the bleed line between the HP bleed port and the HPSOV.

B. Conditioning

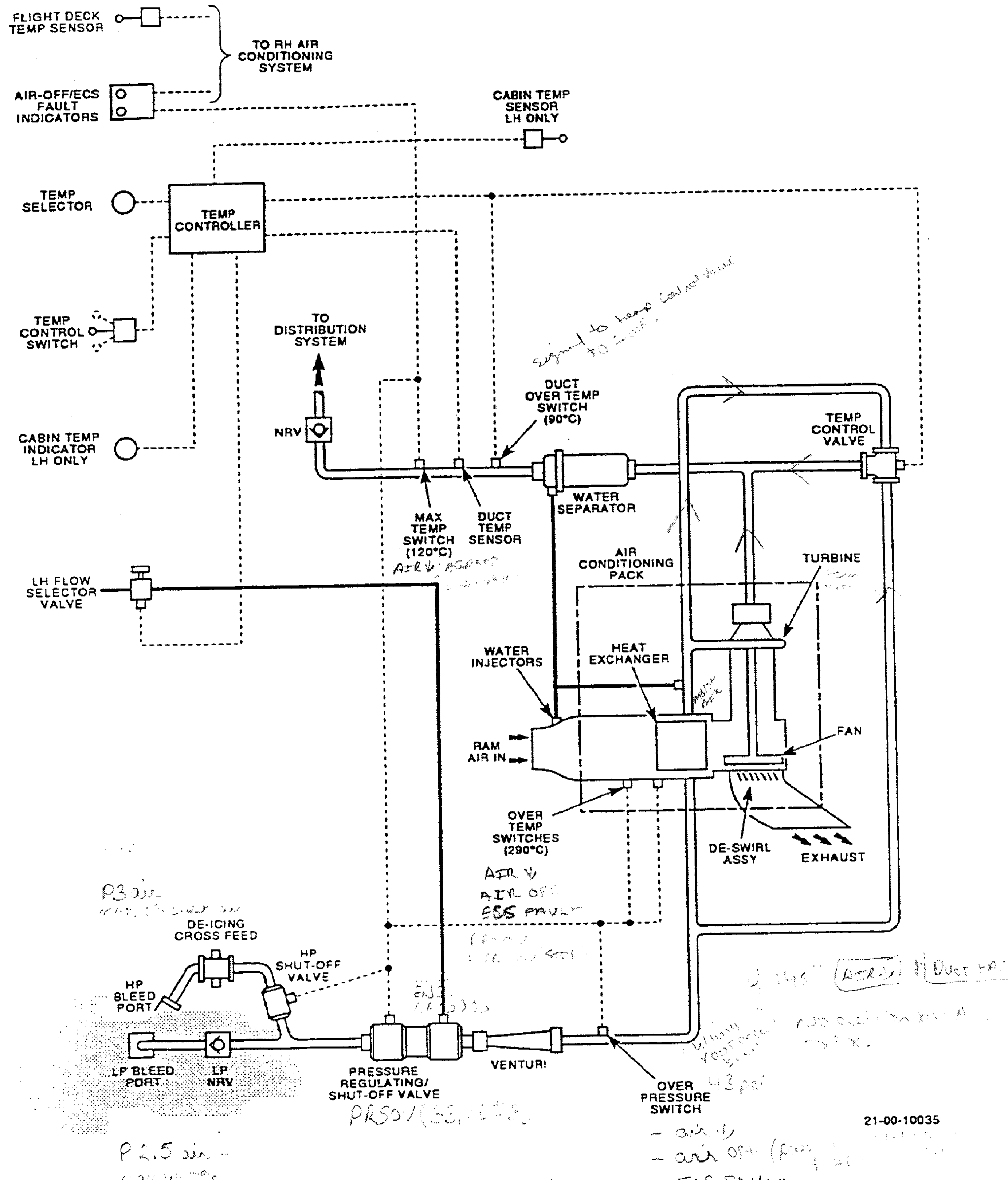
The controlled bleed air from the engine nacelle is ducted along the wing leading edge to the ACP. The heat exchanger in the ACP cools the bleed air to a temperature close to that of ram air. Most of the condensation that forms in the heat exchanger is drained from an outlet header tank.

From the heat exchanger the air goes to the Cold Air Unit (CAU) where it is expanded across a radial turbine. This action reduces the temperature and pressure of the air. The power output of the turbine is absorbed by a fan which causes ram cooling air to flow across the heat exchanger and then overboard.

The output air from the turbine is now cool and enters the water separator where a high proportion of the remaining moisture is removed.

The water drained from the heat exchanger and water separator is piped to two water injectors. These injectors are installed in the ram air duct and spray water into the ram air inlet to help in the cooling procedure.

The ram air duct has a wire grid to prevent internal damage of the ACP.



Air Conditioning System

C. Distribution

From the water separators, the two bleed air supplies enter the aircraft pressure hull through NRV's. The RH supply is divided to supply the flight deck and the forward and aft Temperature Change Over Valves (TCOV). The LH supply is divided to supply only the forward and aft TCOVs.

The TCOVs control the direction of supplies. When the cabin inlet air temperature is less than 15°C the air is directed to the high level distribution duct. If the cabin inlet air temperature is more than 28°C the air is directed to the floor level distribution duct. At temperatures between these values air is directed to both distribution levels. If one engine bleed air supply fails, then the other engine will supply both the flight deck and the passenger cabin.

(1) Cabin Distribution

32°C In the heating mode with the ECS inlet air temperature above 28°C cabin air is sent to the centre aisle ducts. This air is distributed through four outlets in the underfloor distribution ducts. When a high flow rate is set, a further two outlets will open to the centre aisle. These two outlets are spring loaded flap valves and are set to open at a differential pressure of 0.75psi.

In the cooling mode, with the ECS inlet air temperature below 15°C, cabin air is sent forward and aft along underfloor ducts. The air then passes up through riser ducts at the front and rear of the cabin and along parallel ducts in the cabin roof. These ducts supply the Passenger Service Units (PSU's) in the cabin roof. Each passenger receives cooling air from an adjustable vent in the PSU. In the event that all PSU vents are off, pressure relief flap valves in the roof and floor ducts will open to release the system pressure and prevent damage to the ducting. Flap valves are also included to make sure that the air-pressure in the distribution ducts cannot increase 0.75 psi more than the air pressure in the passenger cabin.

(2) Flight Deck Distribution

The RH engine supplies ECS air primarily to the flight deck. This air is used for the following:

- Windscreen demist
- Foot warmers
- Adjustable air vents (punkah louvres).

Two change-over valves let the flight crew independently select between windscreen demist and foot-warmer supply. The adjustable air vents are always supplied with air.

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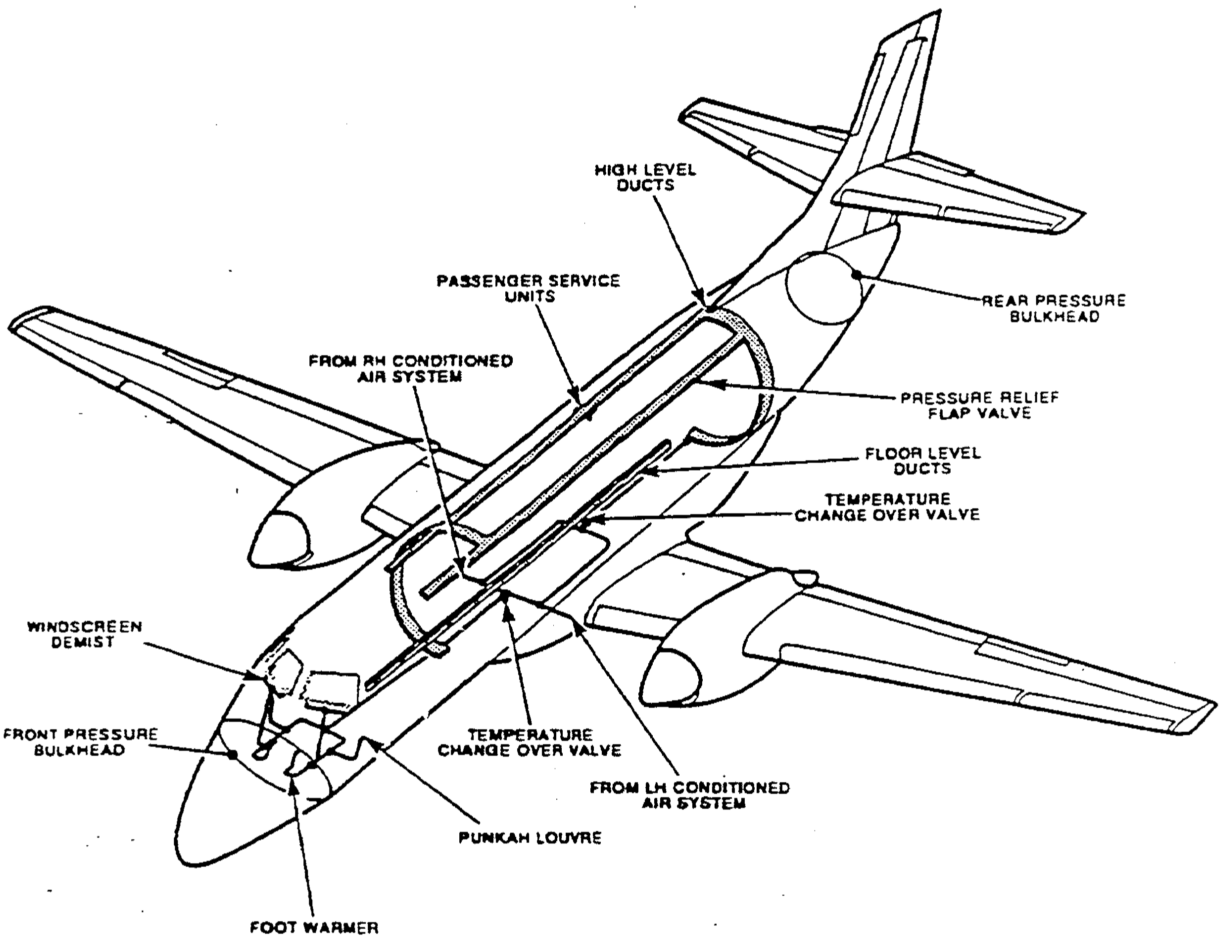

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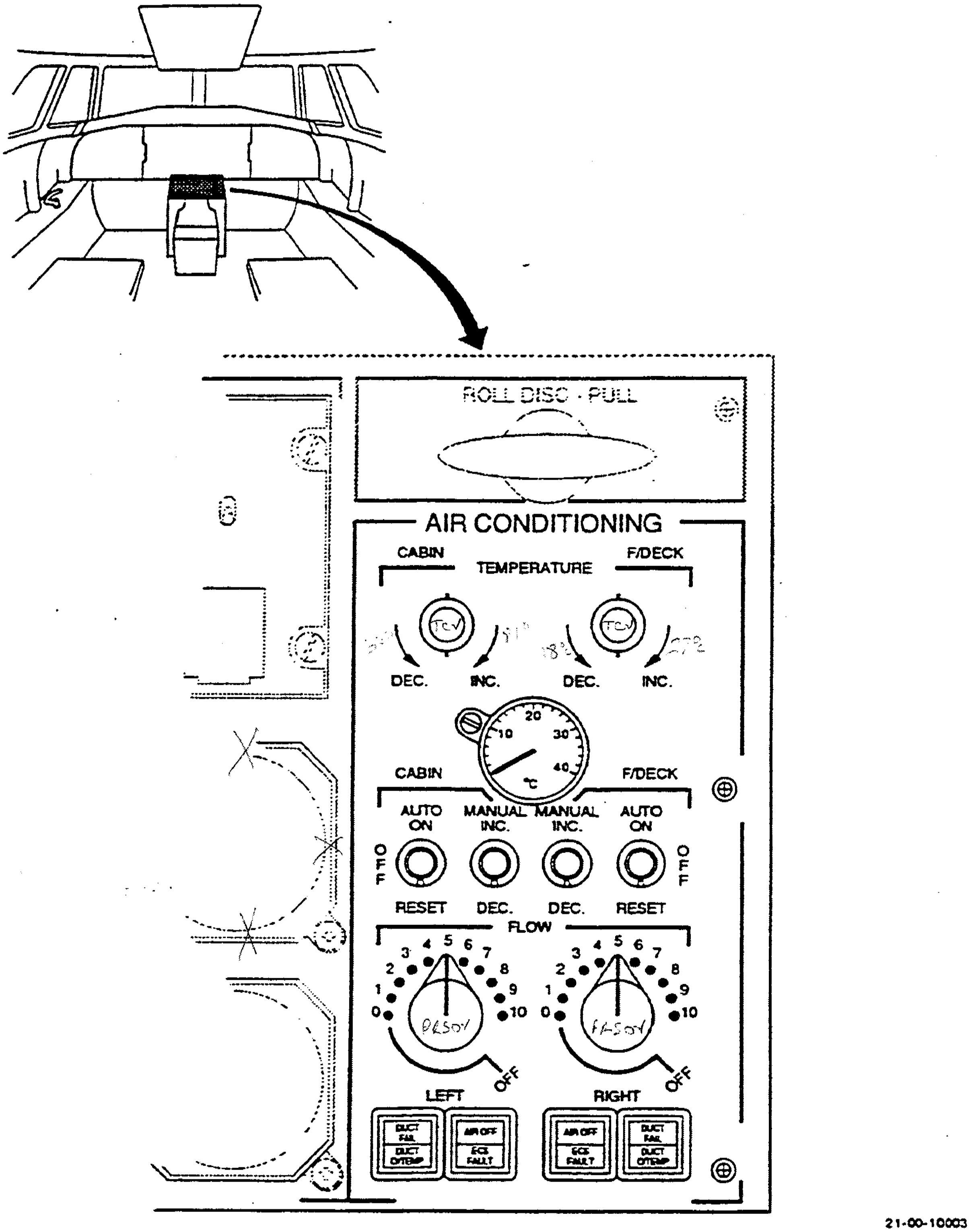
Air Distribution System



Air Conditioning Control Panel

D. Control and Indication

(1) Flow Control

Flow control is achieved by the PRSOV and a independent FLOW selector for each valve. The FLOW selector is installed on the lower centre panel.

When a FLOW selector is turned fully clockwise, the related PRSOV regulates the output pressure to 33psi (±3). This is the maximum flow condition. Counter-clockwise rotation of the FLOW selector gradually closes the PRSOV. The system has independent mass flow control to the FLIGHT DECK (right control) and CABIN(left control).

(2) Temperature Control

Control of the cabin and flight deck temperature is through a three-way Temperature Control Valve (TCV). The TCV regulates the flow of hot air to by-pass the CAU. This hot air is then mixed with cool air at the CAU turbine outlet. Temperature adjustment can be set to automatic or manual.

Automatic control is by the operation of an independent AUTO ON/OFF/RESET switch for both CABIN and FLIGHT DECK. The switches are installed in the AIR CONDITIONING control panel on the lower centre panel of the flight deck. When AUTO ON is selected, the cabin or flight deck temperature is determined by the position of the TEMPERATURE controller. The temperature is controllable within the range +18°C (max DEC) to +27°C (max INC). A temperature controller, installed in the flight deck, compares this set temperature with signals from the duct temperature sensor and cabin or flight deck sensors

This provides a command to change the TCV, however, the duct temperature is limited to +3°C to +75°C. Therefore a duct temperature sensor corrects any cabin/flight deck demands to keep the duct temperature within range.

If the AUTO control fails, a MANUAL control is available. Set the AUTO switch to OFF and the temperature is now controlled with the MANUAL INCrease/OFF/DECrease switch. The switch gives direct manual control of the TCV and is spring loaded to the OFF position.

(3) Pack Start-Up

To reduce CAU air bearing wear on pack start-up, a microswitch is located in the FLOW selector and sets the TCV to the closed position.

When the FLOW selector is between OFF and zero (0) the TCV is closed by the microswitch. On pack start-up the FLOW selector must be at least half flow (5) to ensure start-up of the CAU. After a short start-up period the FLOW selector may be set to any desired position in the 0-10 range.

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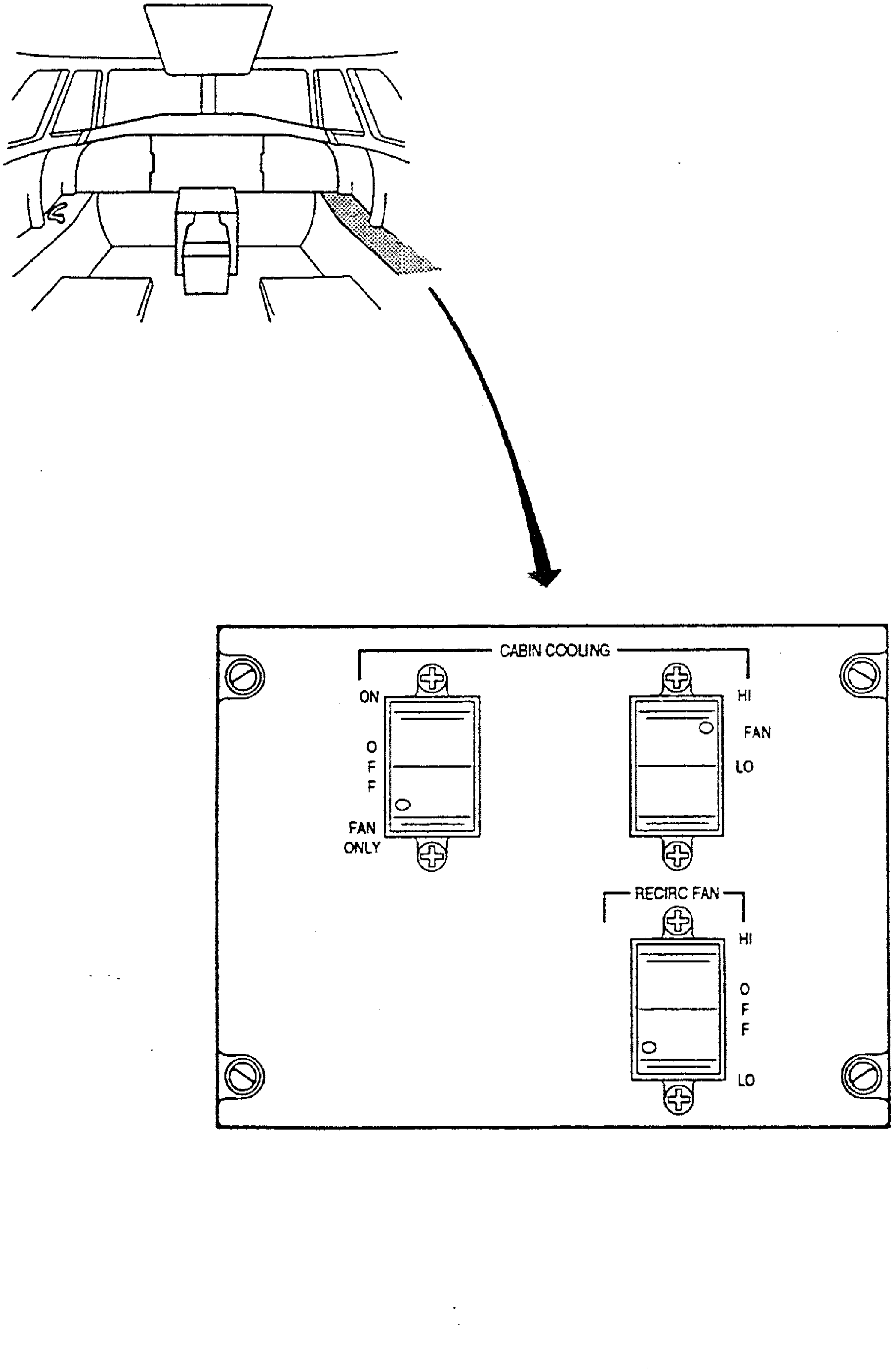


Control Switches

2. Air Conditioning System Protection

The air-conditioning system is protected against over pressure and over temperature failure conditions.

A. Bleed Air Control Failure

Two over-temperature switches are installed in the heat exchanger inlet. These switches protect the heat exchanger from high inlet temperatures, and are set to operate at 290°C. If a switch is activated the HPSOV and PRSOV will close. The indications on the flight deck are:

- A CAP [AIR ↓] (amber) caption
- [AIR OFF] and [ECS FAULT] (amber) captions on the lower centre panel.

The [ECS FAULT] caption will stay on continuously during the fault. The [AIR ↓] and [AIR OFF] captions will stay on only as long as the HPSOV and PRSOV are closed.

When the [ECS FAULT] caption goes out the system is reset by setting the AUTO switch to RESET.

B. Bleed Air Duct Failure

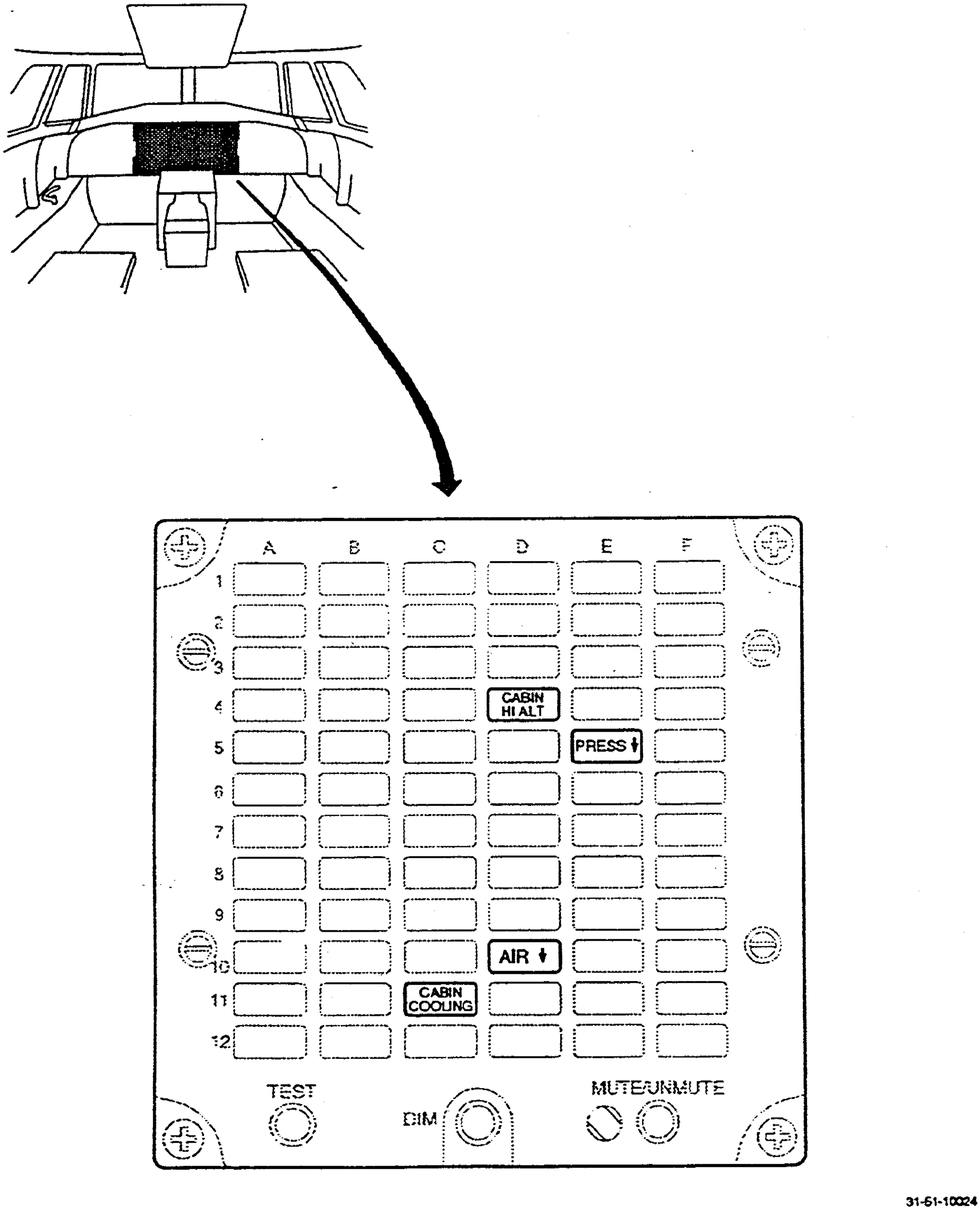
A bleed air duct failure can result in hot air damaging the wing spar. To prevent this, two temperature probes are installed in the leading edge to detect high temperature caused by any leaks.

Air from such a failure goes through a protected area and is vented to atmosphere through a single hole. The temperature probes are installed at the expansion joint in the wing leading edge and in the forward end of the ventral fairing. The temperature probes operate at 145°C ±3.

When the temperature probe is activated, the flight deck indications are:

- A CAP [AIR ↓] (amber) caption
- A [DUCT FAIL] (amber) caption on the lower centre panel.

The [DUCT FAIL] caption will stay on continuously while the hot air is present at the probe.



CAP - Air Conditioning and Pressurization

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C. Flow Control System Failure

To protect the system components against excessive pressure, an over-pressure switch is installed downstream of the flow-limiting venturi. The switch is set to operate at 43psi (±3). If the switch is activated the HPSOV and PRSOV will close. The indications on the flight deck are:

- A CAP [AIR ↓] (amber) caption
- [AIR OFF] and [ECS FAULT] (amber) captions on the lower centre panel.

The [ECS FAULT] caption will stay on continuously during the fault. The [AIR ↓] and [AIR OFF] captions will stay on only as long as the HPSOV and PRSOV are closed. When the [ECS FAULT] caption goes out the system is reset by setting the AUTO switch to RESET.

D. Temperature Control System Failure

Two over-temperature switches are provided to protect the temperature control system from failure. The switches prevent an over temperature condition in the air supply ducts downstream of the water separator.

The first over temperature switch (duct over temp switch) is set to operate at 90°C. When the switch is activated the TCV motors to the closed position. The indications on the flight deck are:

- A CAP [AIR ↓] (amber) caption
- A [DUCT OVTEMP] (amber) caption on the lower centre panel.

The captions will stay on until the AUTO switch is set to RESET. If RESET does not remove the fault then the AUTO control switch should be set to OFF and the MANUAL DECrease selected to obtain the required temperature.

The second over temperature switch (max temp switch) is set to operate at 120°C. The switch will protect the system and passengers if the TCV fails in the heating mode (90°C sensor fails to close TCV). When the 120°C sensor is activated the HPSOV and PRSOV close. The indications on the flight deck are:

- A CAP [AIR ↓] (amber) caption
- [AIR OFF] and [ECS FAULT] (amber) captions on the lower centre panel.

The [ECS FAULT] caption will stay on continuously during the fault. The [AIR ↓] and [AIR OFF] captions will stay on only as long as the HPSOV and PRSOV are closed. When the [ECS FAULT] caption goes out the system is reset by setting the AUTO switch to RESET.

3. Cabin Temperature Sensors And Indication

Temperature sensors are installed in the passenger cabin roof and flight deck roof. A jet pump is provided to give a continuous flow of air over the sensors.

A cabin temperature indicator is installed on the lower centre panel, graduated in increments of 2°C up to 40°C. The indicator receives a signal from the temperature sensor in the passenger cabin. Temperature is shown on the indicator when the cabin temperature control system is in AUTO or MANUAL mode.

4. Air Conditioning System Performance

A. Cooling

With the aircraft on the ground and under the following conditions:

- Engines at TAXI RPM
- An ambient air temperature of ISA +25°C
- 30 passengers and 3 crew.

It is possible to set a system minimum inlet temperature of 3°C and obtain a maximum flight deck/passenger cabin temperature of 18°C. This is with both systems in operation.

B. Heating

When the aircraft is in flight and under these conditions:

- An ambient air temperature of ISA -25°C
- 30 passengers and 3 crew.

It is possible to set a system maximum inlet temperature of 75°C and obtain minimum flight deck and passenger cabin temperature of +27°C. This is with both systems in operation.

5. Vapour Cycle Air-Conditioning System

A. General

The Vapour Cycle Air-Conditioning System (VCACS) can be used in conjunction with the ECS to provide additional cooling for the cabin and the flight compartment. The cabin heating mode of the ECS must be set to OFF to enable the operation of the VCACS.

The VCACS can be operated on the ground and in flight to an altitude of ~~17500~~ 15000 feet.

The VCACS consists of a compressor/condenser assembly and three evaporators. The condenser of the compressor/condenser assembly has a ducted fan driven by the compressor drive motor. Each evaporator has a ducted fan which is driven directly by an electric motor. System protection, control and indication are also provided.

The compressor/condenser assembly is installed in the rear equipment bay, aft of the pressure bulkhead, and is enclosed in a fireproof box. Two aft evaporators are mounted in parallel in the rear baggage bay, and a forward evaporator is installed in the forward, upper right side of the cabin.

Cabin air drawn into the evaporators passes over the evaporator coils, which absorb heat and cool the air. The cold air is then blown from the evaporators into the cabin through two vents. The vent for the forward evaporator is situated on the right wardrobe. The aft evaporators have a common overhead vent.

The air supply to the inlet of the compressor/condenser assembly is ducted from the air inlet on the left side of the rear equipment bay to the fireproof box. The outlet air from the condenser fan is ducted from the fireproof box to the air outlet on the right side of the rear equipment bay.

B. Description

(1) Compressor/Condenser Assembly

The compressor and the condenser fan are driven by the 28 V dc electric motor. The compressor is driven from one end of the motor shaft through a drive belt and pulley arrangement, while the condenser fan is driven directly from the other end of the shaft.

The drive belt and the pulleys of the compressor drive are enclosed by a high impact fire retardent guard. The condenser fan is guarded by a high impact fire-retardant shroud.

(2) Vapour Cycle

The VCACS is a closed-vapour-cycle system which uses refrigerant MP52 to absorb heat.

When the VCACS is switched on:

- The drive motor of the compressor/condenser assembly drives the compressor and the condenser fan
- The evaporator fans operate.

The compressor operates at constant speed and capacity to compress the warm Low Pressure (LP) refrigerant gas to a High Pressure (HP). The hot HP refrigerant gas then passes through the condenser coil, which cools the gas and condenses it to a warm HP liquid. The receiver/drier separates any residual gas from the warm HP liquid, which is then routed to the evaporators. The expansion valve of each evaporator expands the warm HP liquid to a low pressure, this changes the warm HP liquid to a LP supercool gas.

The LP supercool gas passes through the coils of the evaporators and absorbs heat from the cabin air, which passes over the coils by the action of the evaporator fans. The warm LP refrigerant gas from the coils of the evaporators is routed back to the compressor inlet.

C. System Protection

The VCACS is protected against:

- Over pressure
- Under pressure
- Overload of the drive motor
- Over temperature of the driver motor
- Electrical power failure.

(1) Pressure Failure

A binary switch installed at the inlet of the receiver/drier protects the system against over pressure and under pressure conditions. The binary switch incorporates an HP switch and an LP switch.

(a) Over Pressure Protection

The HP switch protects the drive motor against overload if over pressure conditions occur. The HP switch removes electrical power from the compressor control contactor. This stops the compressor drive motor.

(b) Under Pressure Protection

The LP switch protects the compressor if under pressure conditions occur due to low ambient temperature or loss of refrigerant. The LP switch removes electrical power from the compressor control contactor. This stops the compressor drive motor and the compressor/condenser assembly.

(2) Drive Motor Protection

(a) Overload

The HP switch (of the binary switch) protects the drive motor against overload during over pressure conditions in the system. A 150 amp fuse in the electrical supply also protects the drive motor.

(b) Over Temperature

A thermal cut-out prevents the over temperature of the drive motor.

(3) Electrical Power Failure

If either generator fails when the VCACS is operating, the compressor control contactor becomes de-energised. This removes electrical power from the compressor drive motor and stops the compressor/condenser assembly.

D. Control

The control switches of the VCACS are mounted on the control panel on the right console in the flight compartment.

An electrical interlock prevents the VCACS being selected ON when the CAB HEAT switch is also selected ON.

(1) CABIN COOLING ON/OFF/FANS ONLY Switch

This switch controls the start and stop of the VCACS. The switch also:

- Allows the evaporator fans only to operate independent of the compressor drive motor
- Inhibits the selection of the compressor drive motor to on without the evaporator fans also being selected.

When the switch is set to ON:

- The evaporator fans operate
- The compressor control contactor is energised and completes the electrical circuit to the compressor drive motor
- The green CABIN COOLING caption on the Central Annunciator Panel (CAP) comes on
- The compressor drive motor starts.

When the switch is set to OFF:

- The compressor control contactor becomes de-energised and removes electrical power from the compressor drive motor
- The green CABIN COOLING caption of the CAP goes off
- The compressor drive motor stops
- The evaporator fans stop.

When the switch is set to FAN ONLY, the evaporator fans operate independently.

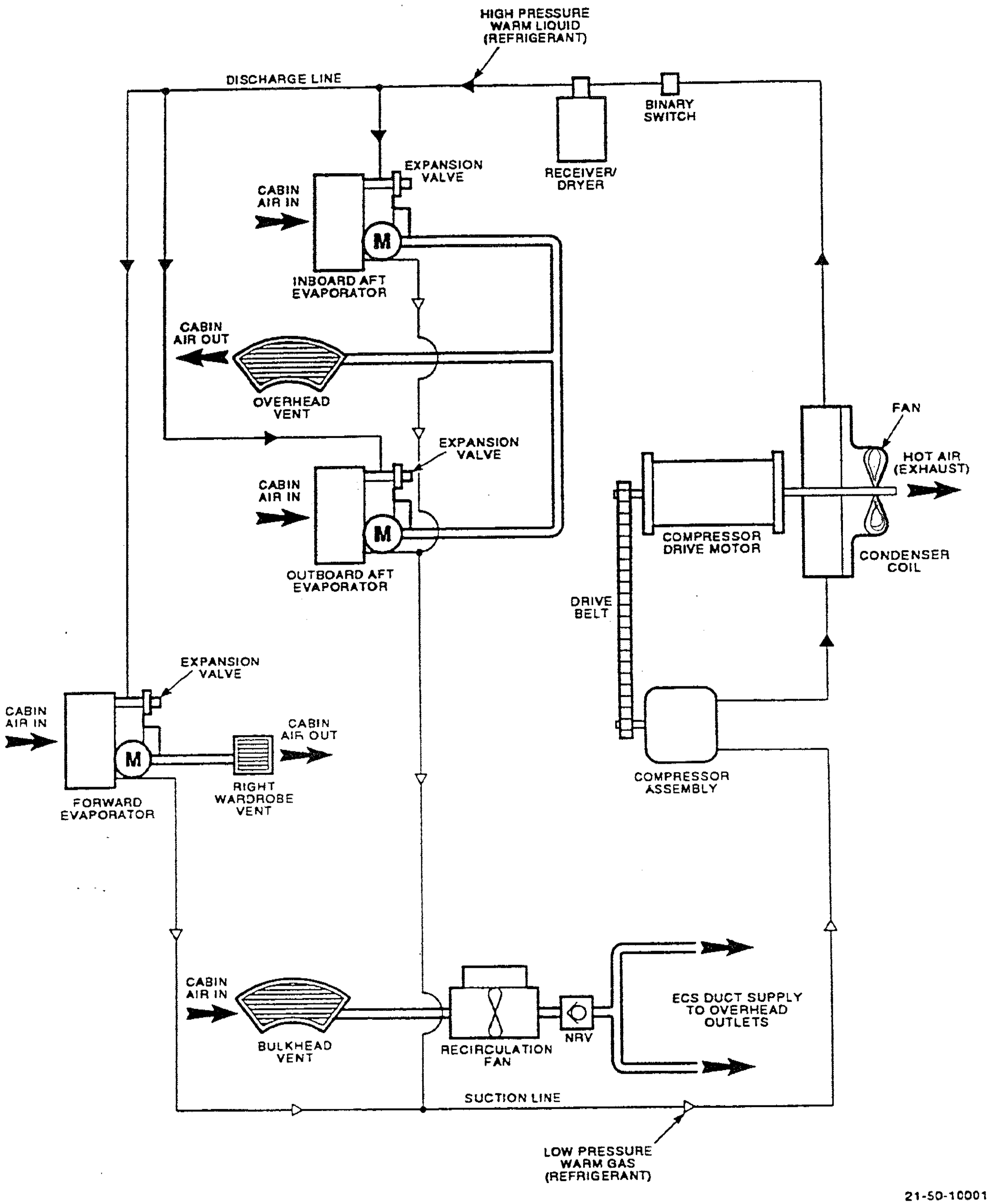
(2) CABIN COOLING FAN HI/LO Switch

This switch is used to select the evaporator fans to HIgh (maximum flow) or LOw (50% flow) when the CABIN COOLING ON/OFF/FAN ONLY switch is set either to ON or FAN ONLY.

E. Indication

The green CABIN COOLING caption of the CAP comes on when electrical power is supplied to the compressor drive motor. The caption goes off when the electrical power is removed.

An hour meter in the rear equipment bay provides visual indication of the total number of hours that the VCACS is selected ON.



Vapour Cycle Air Conditioning System and Recirculation Fan

5.1 Recirculation Fan

A. General

The recirculation fan can be used to recirculate the air in the cabin when the ECS is not operating. The recirculation fan provides a continuous air flow through the punkah louvre outlets in the cabin.

The recirculation fan can be used on the ground and in all conditions of flight.

The recirculation fan assembly consists of a ducted fan which is driven by an electric motor. A check valve is situated in the outlet duct of the fan enclosure.

The recirculation fan is installed in the main baggage compartment.

B. Control

The recirculation fan is controlled by the RECIRCulation FAN switch mounted on the control panel on the right console of the flight deck.

The RECIRCulation FAN switch is used to select the recirculation fan to HIgh (full flow), LOW (50%flow) or OFF.

The RECIRCulation FAN switch power supply is from the 28V dc non-essential busbar.

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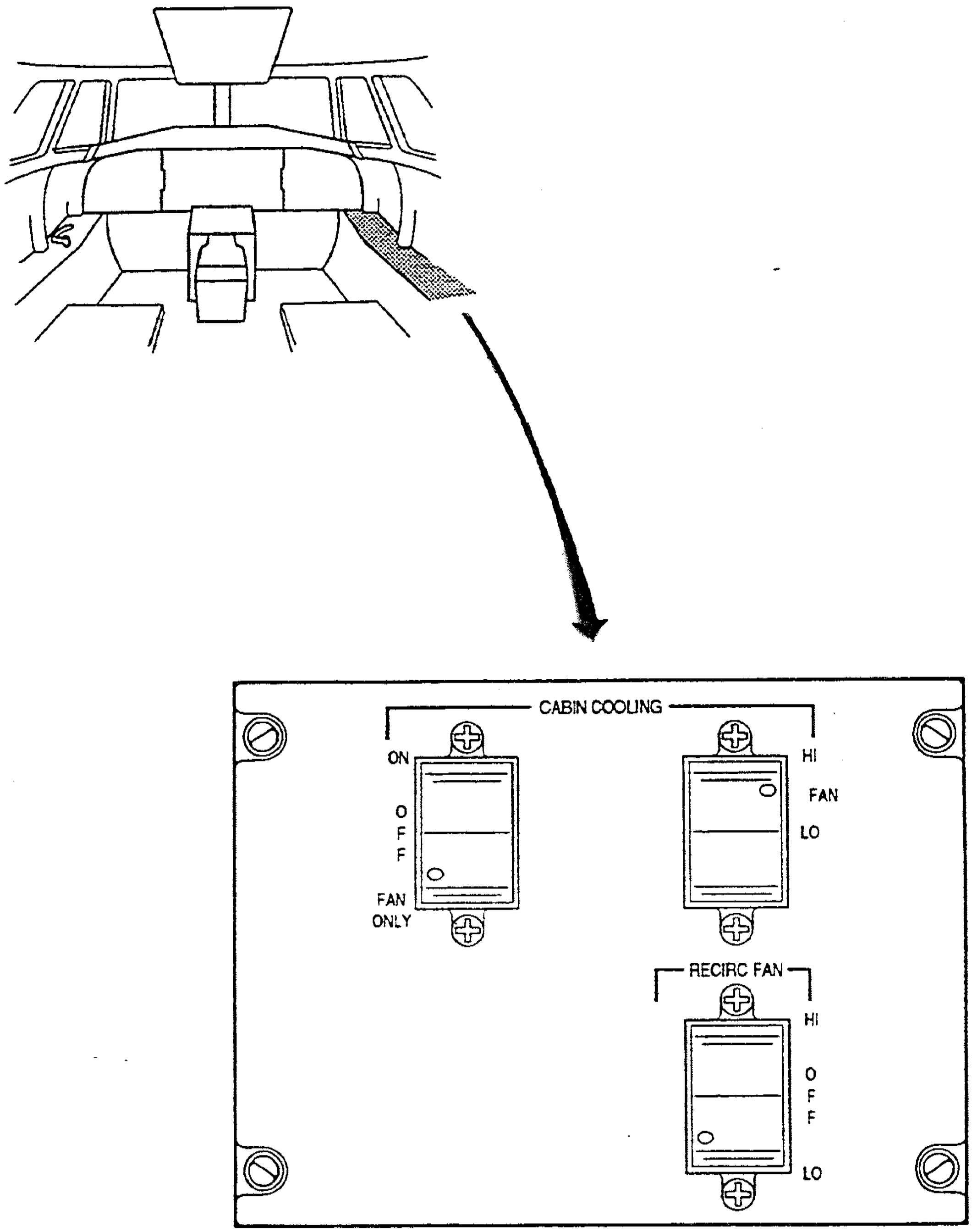

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Control Switches

6. Pressurization

A. General

The aircraft has a Cabin Pressurization Control System (CPCS) installed. Cabin pressure is controlled by regulating the outflow of passenger cabin air through an electro-pneumatic outflow valve installed on the rear pressure bulkhead. The normal operating differential pressure is controlled at 5.7 psi to permit a maximum cabin altitude of 8,000 ft at the maximum aircraft operating altitude of 25,000 ft.

B. Components

The CPCS includes the following components:

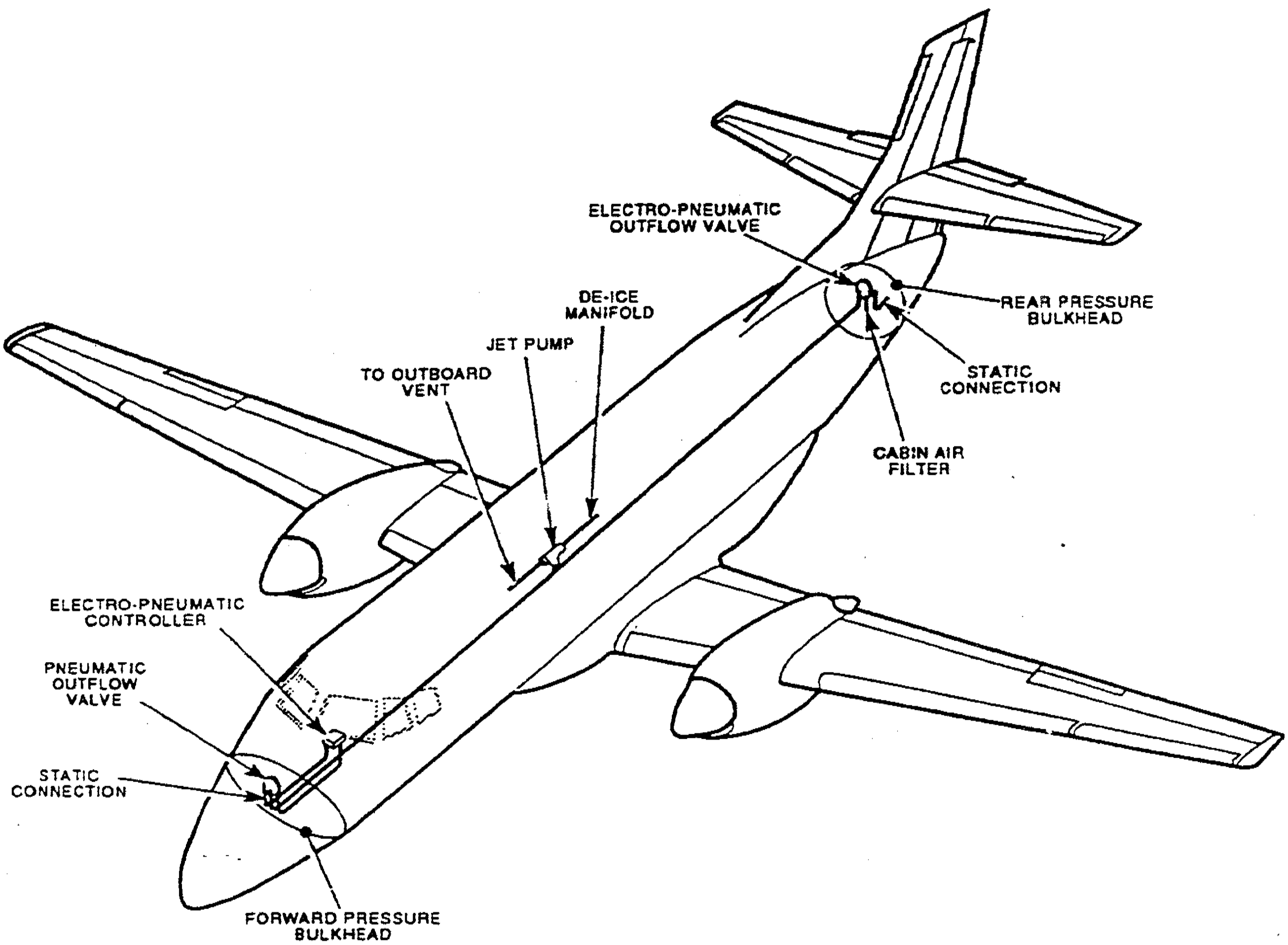
- Electro-pneumatic outflow valve
- Pneumatic outflow valve
- Electro-pneumatic controller
- Jetpump
- Cabin air filter.

(1) Electro-Pneumatic Outflow Valve — Auto

This valve is installed on the rear pressure bulkhead, it regulates the cabin pressure in the AUTO mode of operation. In addition to the normal differential pressure of 5.7 psi the valve also includes an overpressure relief at 6.0 psi, negative pressure relief at minus 0.3 psi and a cabin altitude limit of 14,500ft (±500).

(2) Pneumaic Outflow Valve

This valve is installed on the forward pressure bulkhead, it regulates cabin pressure in the MANual mode of operation. The valve also provides overpressure relief at 6.0 psi and negative pressure relief at 0.3 psi



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Pressurization System

(3) Electro-Pneumatic Controller

Installed in the flight deck lower centre panel the controller includes the AUTO and MANual controllers.

(4) Jetpump

Installed in the ventral pod, it supplies a negative pressure for both outflow valves and the cabin pressure controller. The jetpump is fed with HP bleed air, regulated at 21.5 psi, from the airframe de-ice low-pressure manifold.

(5) Cabin Air Filter

Installed forward of the rear pressure bulkhead it filters cabin air supply to the electro-pneumatic outflow valve.

C. Indications And Warnings

(1) Indication Gauges

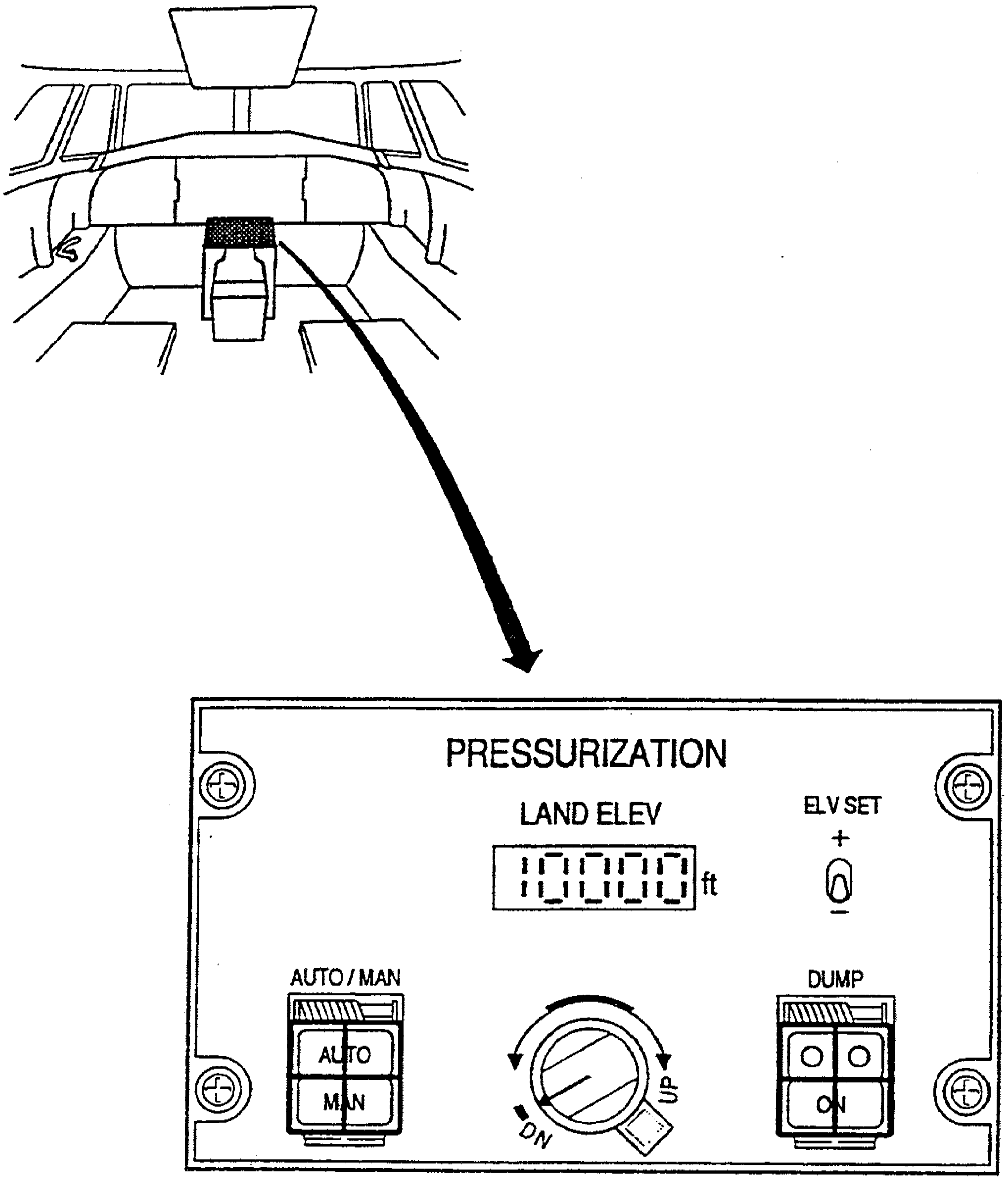
Two gauges are installed in the lower centre panel. A combined gauge to show:

- Cabin altitude
- Cabin pressure differential.

A rate of climb gauge is also provided.

(2) Pressure Warning System

If the pressure in the cabin falls and the altitude exceeds 10,000ft. (± 500) a low cabin pressure warning switch will operate and a CAP [CABIN HI ALT] (red) caption will come on. A signal is also sent to the flight data acquisition unit.



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Electro-Pneumatic Controller

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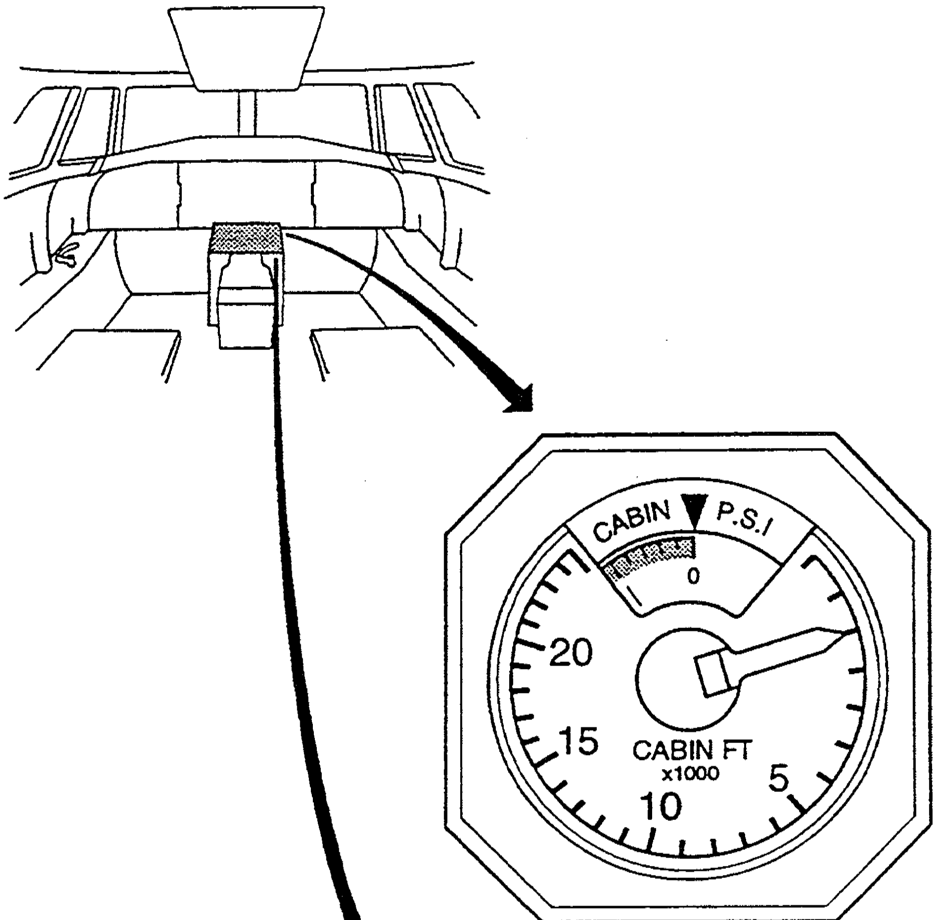
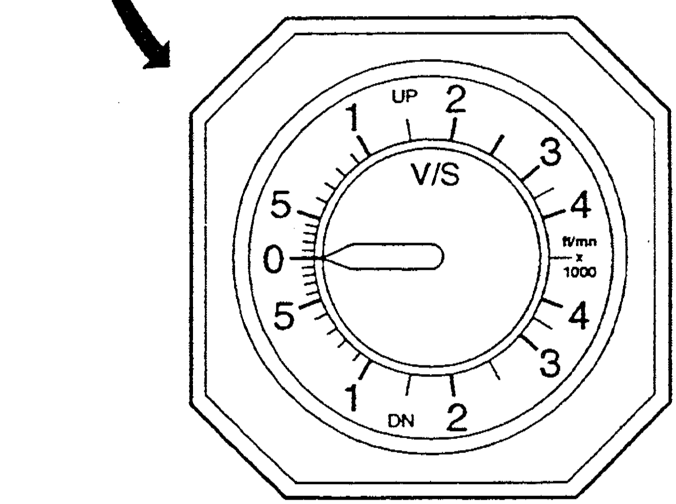


CABIN ALTITUDE/DIFFERENTIAL PRESSURE INDICATOR



RATE-OF-CLIMB INDICATOR

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Pressurization-Indication

7. Modes Of Operation

A. Normal Operation (AUTO mode)

For the normal (AUTO mode) operation, the guarded AUTO/MAN switch on the electro-pneumatic controller must be set to AUTO and the AUTO caption must be on.

The controller, when in the AUTO mode, controls the passenger cabin altitude and rate of change. The destination altitude must be set before take-off, except when the destination altitude is greater than 8,000ft. In this case the altitude must be set to 8,000ft before take-off and the actual destination altitude set during descent. This will prevent the in-flight cabin altitude exceeding 8,000ft. The electro-pneumatic outflow valve is controlled automatically.

B. Automatic Pre-Pressurization On The Ground

The function of this sequence is to prevent cabin pressure surges and the need for pressure adjustment during take-off. The sequence is started through the weight-on-wheels switches and when the POWER levers are advanced to the take-off position.

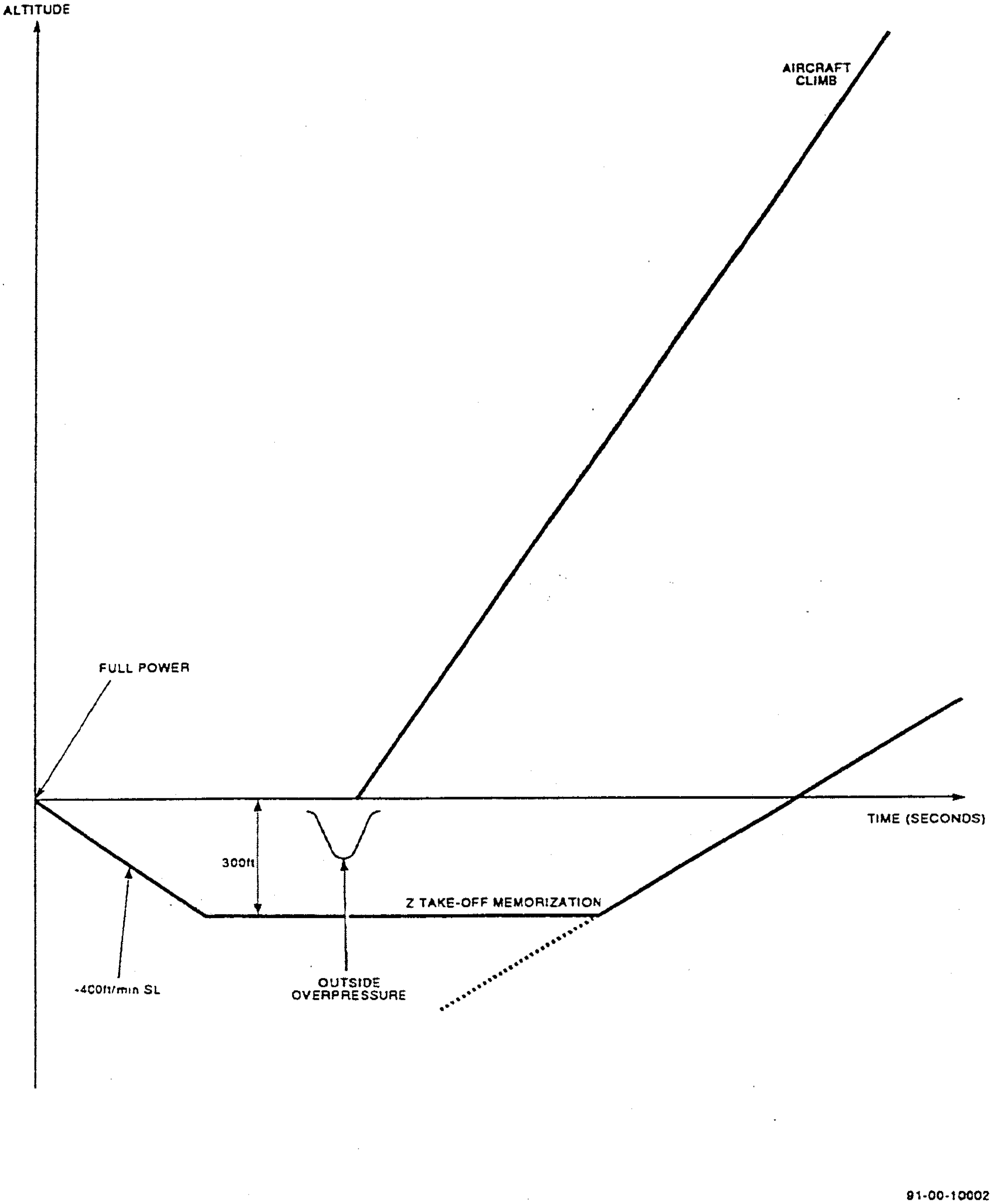
With air-conditioning ON for take-off, the cabin altitude descends at 400ft/min to 300ft differential altitude. With the air-conditioning OFF, both pneumatic outflow valves will close.

C. Flight Sequence

At the end of the take-off sequence and when the weight-on-wheels switches indicate that the aircraft has left the ground, the normal flight sequence is started.

The pressurization system will give minimum cabin altitude based on a maximum pressure differential of 5.7 psi. The cabin maximum altitude is 8,000 ft unless a higher landing altitude is set on the controller. The maximum rate of climb of the cabin is 620ft/min and maximum rate of descent is 400ft/min.

If there is an emergency descent, indicated by a high aircraft rate of descent, the system increases the cabin rate of descent but to no more than 1,100ft/min.



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Automatic Pressurization and Take-Off Sequence

D. Automatic Depressurization On The Ground

To prevent changes in cabin pressure during landing, the aircraft will land with a differential cabin altitude of minus 300ft.

When the aircraft is on the ground with the POWER levers moved behind FLIGHT IDLE, the automatic depressurization sequence is started. The cabin is depressurized at a rate of climb of 620ft/min and, when no residual pressure exists, both outflow valves are fully open.

E. Automatic Mode Test

A test of the automatic mode is done with the aircraft electrical power set to ON. If a system fault is found a CAP PRESS↓ (amber) caption comes on and a fault code appears on the cabin pressure controller LCD display. The test and indication system operates continuously during operation in the automatic mode.

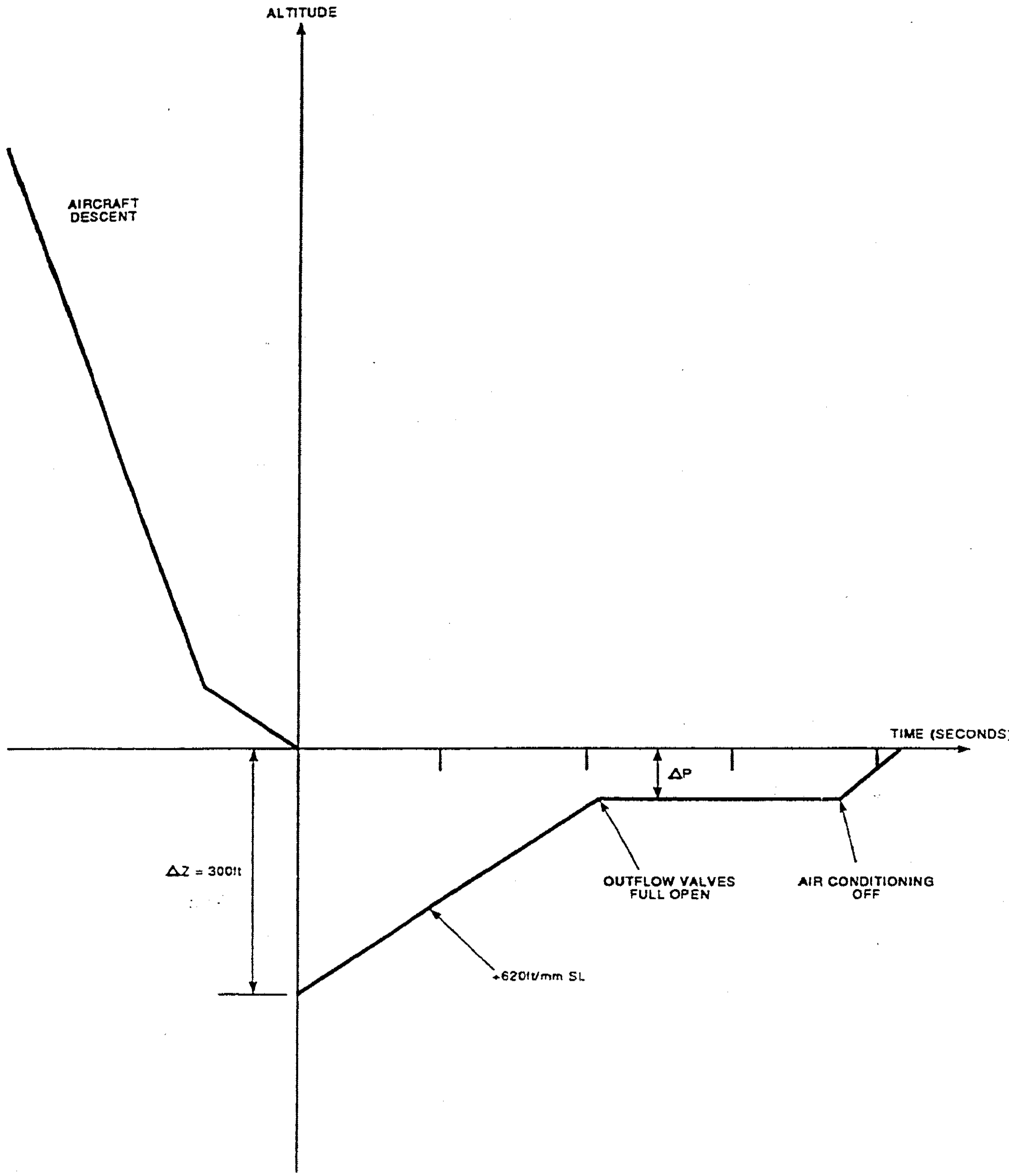
If a fault code is present on the display it should be recorded for technical debrief. To reset the display, cycle the controller to MAN and back to AUTO.

F. Reversionary Operation (Manual Mode)

If the automatic mode fails then manual operation of the pressurization system is available. The guarded AUTO/MAN switch on the cabin pressure controller must be set to MAN, this is indicated by a MAN caption on the switch.

In MANUAL mode the pneumatic outflow valve, installed in the forward pressure bulkhead, is opened pneumatically by the manual controller. The controller will allow the pilot to select any cabin altitude rate of change between a descent of 1,500ft/min and a climb of 2,500ft/min.

The controller must be slowly adjusted to achieve the desired rate of change of cabin height. When the required cabin altitude is reached a zero rate of change should be set. During operation in the manual mode the electro-pneumatic outflow valve will remain closed.



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Automatic Depressurization Sequence

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8. System Protection

A. Overpressure Relief

If a differential pressure of 6 psi is reached both outflow valves will open to control the pressure at that level. Should one valve fail then the remaining valve will control the pressure.

B. Negative Pressure Relief

If the ambient pressure is slightly greater than the cabin pressure the negative differential relief devices (installed in both outflow valves) will operate to keep the negative differential at minus 0.3 psi.

If one outflow valve device fails to operate, the remaining valve will control the pressure.

C. Cabin Altitude Limitation

If the cabin altitude reaches 14,500 ft the opening of the electro-pneumatic outflow valve decreases to maintain the cabin altitude at this value.

NOTE: If the cabin altitude reaches an abnormal reading (especially when the 10,000ft indication illuminates) check that the manual control knob is correctly set.

D. Rapid Depressurization

If it is necessary to dump the cabin pressure whilst in either automatic or manual modes then the guarded DUMP switch must be set to ON. This will be indicated by the caption on the switch.

The dump selection activates the electro-pneumatic outflow valve to the fully open position. However, when the cabin reaches an altitude of 14,500ft (± 500) the cabin altitude limitation device will override the dump function and the cabin will be held at this altitude. With an aircraft altitude of 26,000ft the cabin will rise from 8,000ft to 14,500ft in 20 seconds.

If further rapid depressurization is required the manual control can be used, whilst in the manual mode, to completely dump pressurization. This will raise the cabin altitude at a rate of 2,500ft/min.

E. System Inputs

(1) Automatic Mode Discrete Inputs

The automatic mode controller has discrete inputs of:

- Door open signal
- POWER lever switch position
- Weight-on-wheels switch position.

The door open signal prevents the aircraft being pressurized unless the door is closed and locked. The POWER lever and weight-on-wheels inputs identify the correct mode of operation for the controller.

F. Air Data

Both Air Data Computers (ADC 1 and ADC 2) independently provide aircraft altitude, aircraft rate of change of height and barometric correction to the system.

In normal operation ADC 1 is used but if a fault occurs ADC 2 is automatically selected.