GENERAL

The air conditioning system provides temperature-regulated, conditioned air to the cockpit and passenger cabin using two air conditioning units (ACU's), commonly referred to as "packs".

An electric cockpit heating system and an avionics cooling system are also provided.

Aircraft pressurization is accomplished by regulating the overboard discharge of the conditioned air through two outflow valves. The automatic pressurization system maintains cabin pressure to provide passenger comfort throughout all phases of flight within the limitations of the aircraft structure.

During unpressurized flight, ram air may be used to ventilate the cockpit and cabin.

AIR CONDITIONING SYSTEM

Description

The air conditioning system converts 10th-stage bleed air from the engines, APU, or an external source into temperature-regulated pressurized air for distribution to the cockpit and cabin.

The air conditioning system consists of two packs, a temperature control system, distribution ducting, and a ram air system for pack cooling and supplementary ventilation.

A single pack can provide sufficient air to cool and pressurize the aircraft.

Components and Operation

Packs

The packs are located in the aft equipment bay, and are referred to as the left pack and right pack. The L (R) PACK switch/lights on the AIR CONDITIONING panel are used to operate the respective air conditioning pack.

The packs are monitored for overtemperature and overpressure conditions and have automatic protection for both cases.

The left pack is powered by the DC essential bus, and the right pack is powered by DC bus 2. In the event of a double-generator failure when airborne, leading to deployment of the air-driven generator, the left pack remains operational, enabling continued flight at high altitude.

In the event of a single-pack failure, the remaining pack can supply sufficient conditioned air to both compartments.

Pack Pressure Regulation

When the L (R) PACK switch/light is pressed in, the corresponding pressure-regulating shutoff valve (ACU valve) allows bleed air from the 10th-stage manifold to enter the pack. The ACU valves operate in two different modes, low mode or high mode, according to the following conditions:

- Low Mode: Airborne during dual-pack operation, or on the ground with the engines supplying the bleed air, output pressure 24 psig;

AIR CONDITIONING SYSTEM (CONT'D)

- High Mode: Airborne during single-pack operation, or on the ground with the APU/Ground Air Source supplying the bleed air, output pressure 39.5 psig.

NOTE

If single pack operation results from causes other than overpressure or overtemperature, then the failed pack switch/light must be deselected in order for the remaining pack to operate in high mode.

Pack Operation

The right pack normally operates from right engine bleed air and the left pack normally operates from left engine bleed air.

The prime function of the packs is to produce cold air. Heat exchangers and a cold air unit are used to cool the bleed air as it flows through the pack. The temperature of the hot bleed air entering the pack is first reduced by the precooler heat exchanger and the primary heat exchanger. The pressurized air then enters the cold air unit compressor, the secondary heat exchanger, and finally the cold air unit turbine to complete the cooling process.

Pack Air Treatment

A bleed air cleaner unit removes contaminants from hot 10th-stage bleed air prior to entering the precooler. The air is cleaned by a combination of vortex generation and centrifugal action.

A portion of the water contained in the bleed air is removed after passing through the secondary heat exchanger. Pack discharge air temperature is controlled by the low-limit valve, which maintains the cold air unit output just above freezing. The air then passes through the water separator, where water vapor is removed from the cold air prior to entering the cabin or cockpit distribution ducting.

Pack Output

Cold Air

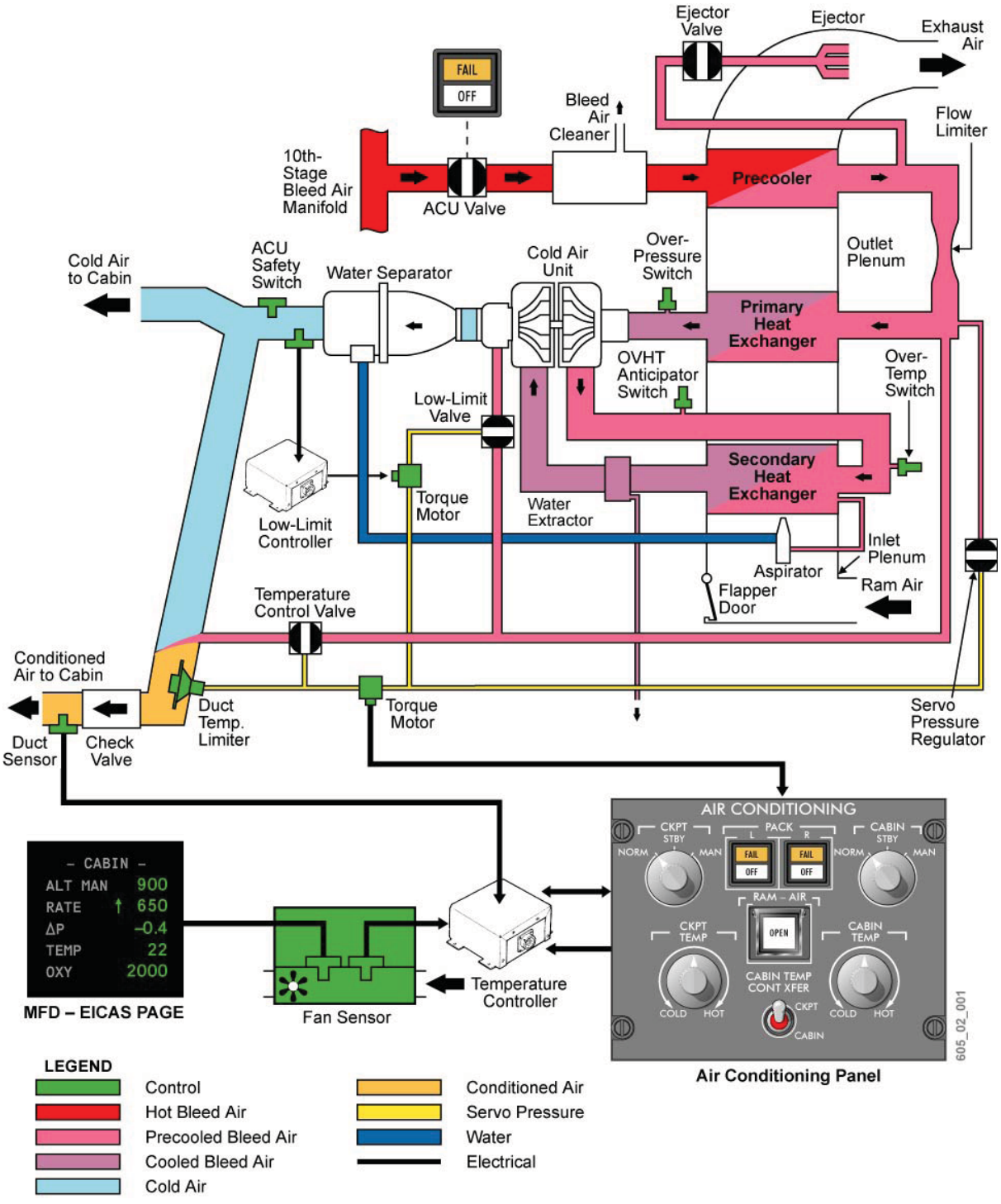
Cold air from the right pack is ducted via a check valve on the aft pressure bulkhead, through flexible insulated ducts, to each passenger position along the right cabin and to the cockpit. Cold air is also drawn from these ducts and routed below the cabin floor to cool the avionics equipment. The cold airflow in the cockpit is divided to supply the pilot’s and copilot’s adjustable cold air vents on the overhead panel.

Cold air from the left pack is similarly ducted to the left cabin cold air outlets and to the avionics bay. Crossover ducts allow a cold air supply to both sides of the cabin, the cockpit area, and for avionics cooling, from one pack if necessary.

Conditioned Air

A balancing valve is located in each branch of the cabin conditioned air duct. The balancing valves are used to balance the airflow between left and right sides of the cabin, and between cabin and cockpit. Conditioned air is vented into the cabin area by ducting located below the windows on either side of the fuselage. In the cockpit, the conditioned air is supplied to both sides through outlets located on the side consoles, and adjustable gasper vents located on the side panels.

AIR CONDITIONING SYSTEM (CONT'D)



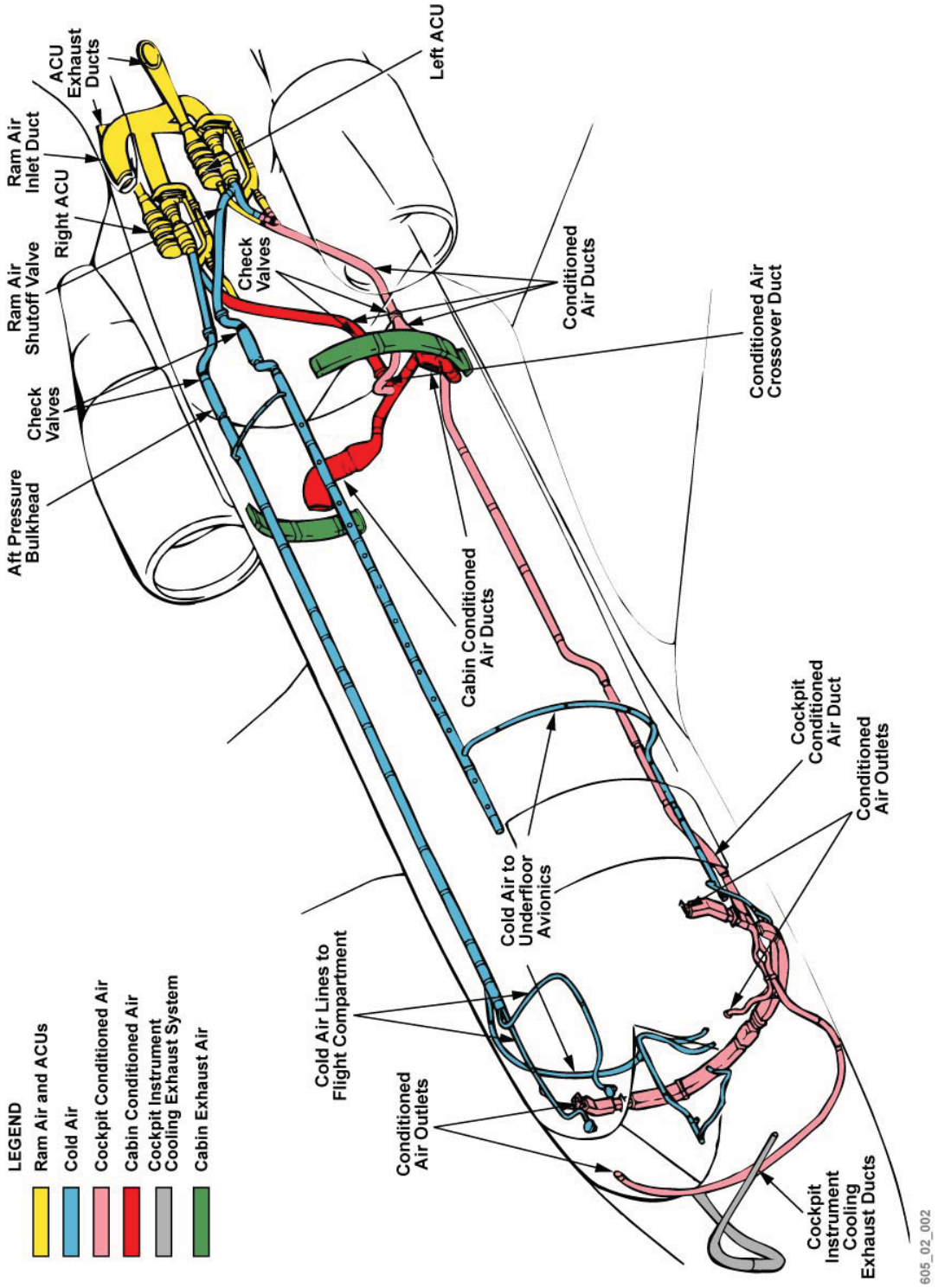
Air Conditioning Pack – Schematic
Figure 02–10–1

AIR CONDITIONING SYSTEM (CONT'D)

Air Conditioning Distribution

The cabin requires a greater volume of conditioned air than the cockpit. To achieve this, 100% of the right pack's conditioned air, and 40% of the left pack's conditioned air, is ducted to the cabin. The remaining 60% of the left pack's output is ducted to the cockpit.

AIR CONDITIONING SYSTEM (CONT'D)



Air Conditioning Distribution
Figure 02–10–2

AIR CONDITIONING SYSTEM (CONT'D)

Temperature Control

Each pack has an identical but independently operated temperature control system. The left pack is controlled by the cockpit temperature control system, and the right pack is controlled by the cabin temperature control system. Each controller subsystem is comprised of the following components:

- Fan sensor;
- Duct temperature sensor;
- Mode selector;
- Temperature selector;
- Temperature controller; and
- Temperature control valve.

Duct Temperature Sensors

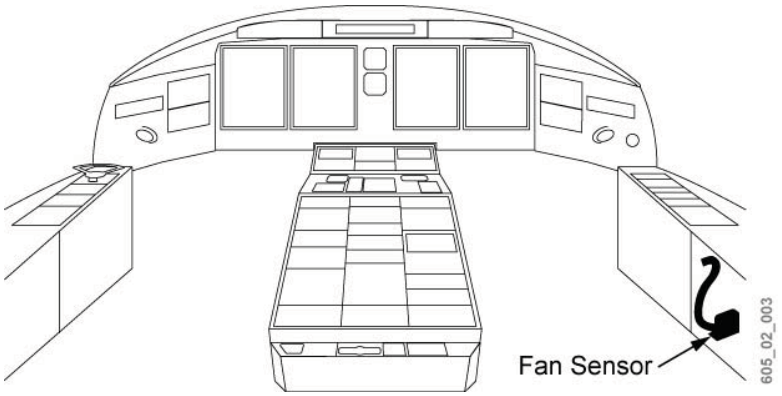
The duct temperature sensors consist of two thermistor elements, exposed to duct airflow, within a probe-type housing. The sensor is connected to the temperature controller, and provides one of the inputs for automatic temperature control.

Cabin and Cockpit Fan Sensors

The fan sensors consist of a vane axial fan and a circuit board which contains a control sensor and an indicator sensor. The fan draws air over the sensors. The sensed temperature is converted to an electrical signal and passed to the temperature controller. The temperature signal from the cabin fan sensor is used for the CABIN TEMP display on the EICAS and the SUMMARY page.

NOTE

It is important to keep the area around the fan sensors free from objects and contaminants to ensure proper operation.



Flight Compartment Fan Sensor
Figure 02–10–3

AIR CONDITIONING SYSTEM (CONT'D)

Temperature Controller

The temperature controllers monitor the cockpit or cabin temperature using the respective fan sensor, duct temperature sensor, and the position of the CKPT TEMP and CABIN TEMP selectors on the AIR CONDITIONING panel. The temperature controllers automatically modulate the temperature control valve to maintain the selected temperature when in NORM or STBY modes.

Mode Selectors

The mode selector knobs to control temperature in the cockpit (CKPT) and passenger cabin (CABIN) are located on the AIR CONDITIONING panel, and can be selected to NORM, STBY, or MAN modes.

NORM Mode

In normal mode, the temperature controller provides automatic temperature control in the selected compartment, using inputs from the fan sensor, the duct sensor, and the temperature selector.

When there is more than a 3°F difference between the actual and selected temperature, the temperature control valve is commanded to full hot or full cold. When the actual and selected temperature is within 3°F, the duct temperature is controlled by modulating the temperature control valve to maintain the selected temperature. The NORM mode temperature control range is from 16°C to 32°C (60°F to 90°F).

STBY Mode

In standby mode, the temperature controller provides automatic control of the supply air temperature. The compartment control loop is bypassed and the temperature controller uses inputs from the temperature selector and the duct sensor. The supply air temperature can be varied between 2°C (35°F) and 82°C (180°F) through the rotation of the temperature selector.

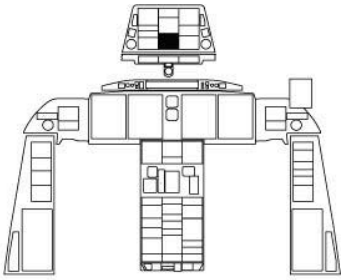
MAN Mode

When manual mode is selected, the flight crew directly commands the temperature control valve by adjusting the respective temperature selector on the AIR CONDITIONING panel. The temperature control valve can be positioned anywhere between full closed and full open.

CKPT TEMP and CABIN TEMP Selectors

The temperature selector knobs to control temperature in the CKPT and CABIN are located on the AIR CONDITIONING panel. They are rotated to vary the desired cabin or flight compartment temperature within the selected mode limits.

AIR CONDITIONING SYSTEM (CONT'D)



AIR CONDITIONING Panel
Figure 02–10–4

Pack Pressure and Temperature Protection

Pack overpressure monitoring is accomplished by an overpressure switch in the output of the primary heat exchanger. An overpressure condition will cause the affected pack to shut down (by closing the pressure-regulating ACU valve). During an overpressure condition, the 10th-stage isolation valve and the applicable 10th-stage shutoff valve will also close automatically. A pack overpressure condition will illuminate the FAIL annunciation in the affected L (R) PACK switch/light and display the **L (R) PACK HI PRESS** caution EICAS message.

Pack overtemperature monitoring is accomplished using a temperature sensor located in the ducting between the compressor of the air cycle machine and the secondary heat exchanger. Compressor outlet temperatures above the trip setting cause the pack to shut down automatically (by closing the pressure-regulating ACU valve), illuminating the fail annunciation in the affected L (R) PACK switch/light and displaying the **L (R) PACK HI TEMP** caution EICAS message. Once the pack has cooled, it can be re-selected.

A thermostatic switch is located in the cold air outlet duct of each ACU. Hot bleed air could enter the ACU if the ACU valve failed to close when the ACU is selected off. The switch causes the **L (R) PACK NOT OFF** caution EICAS message to be displayed.

Pack Cooling

Ram air, taken from the air scoop in the base of the vertical fin, is used as the cooling medium for the heat exchangers. Ram air passes across the precooler and the dual heat exchangers, extracting heat from the bleed air used by the air-conditioning packs. The ram air is discharged through exhaust louvers on the upper left and right sides of the aft fuselage.

During ground operations, when airflow through the ram air scoop is inadequate for cooling of the heat exchangers, an ejector valve opens automatically and draws ambient air from the aft equipment bay for use in the heat extraction process. The ejector valve may also be automatically commanded open in flight if insufficient pack cooling is detected.

AIR CONDITIONING SYSTEM (CONT'D)

Cabin Temperature Control Transfer

When the CABIN TEMP CONT XFER switch on the AIR CONDITIONING panel is selected to CABIN, it transfers the control of the cabin temperature to the cabin electronic system (CES).

When CKPT is selected, the cockpit has control of temperature settings of the cabin.

Foot Warmer Mats

Temperature-regulated, heated mats provide heat for the pilot’s feet. This system is fully automatic and does not require pilot input for operation. It is also self-monitoring and will shut down during overtemp.

Avionics Cooling System

The underfloor avionics bay is cooled by a combination of cockpit exhaust air and a portion of the cold air output from each pack. Adaptive flight displays (AFDs) and instruments in the flight compartment instrument panel, control panels, and display units in the center pedestal, and some of the electronic units in the underfloor avionics bay (e.g. IRUs, DCUs) are cooled with recirculated air from their integral fans. In addition, an automatic cooling system, with its own fan, draws hot air from behind the flight compartment instrument panel and exhausts it under the copilot’s seat area. All fans activate automatically when AC power is applied to the airplane.

If the avionics cooling fan drops to less than 60% of its rated speed when cooling is demanded, a **DISPLAY FAN FAIL** status EICAS message will be displayed. This message extinguishes when fan speed recovers, or when cooling is no longer demanded.

Ram Air Valve

If both packs are inoperative (unpressurized flight), the ram air valve can be opened to allow air from the ram air scoop to enter the mixing manifold and ventilate the cockpit and the passenger cabin. The ram air valve is controlled by the RAM-AIR switch/light located on the AIR CONDITIONING panel. The white OPEN legend will illuminate when the valve is opened.

NOTE

An airspeed of 250 KIAS is recommended during cruise to provide sufficient airflow to passengers within the cabin.

PRESSURIZATION SYSTEM

Description

Cabin pressurization is achieved by controlling the leakage rate, or outflow, of aircraft cabin air through two outflow valves. The outflow valves are located on the aft pressure bulkhead, and are normally controlled by the cabin pressure controller (CPC).

During normal operation, the pressurization system automatically maintains cabin pressure through all phases of flight. The flight crew only needs to set the landing field elevation and baro-correction input. Controls are provided on the CABIN PRESSURIZATION panel, and indications are on the EICAS page and SUMMARY page.

PRESSURIZATION SYSTEM (CONT'D)

Components and Operation

Cabin Pressure Acquisition Module

The cabin pressure acquisition module (CPAM) provides the data concentrator units (DCUs) with pressurization data for display on the EICAS.

EICAS indications include:

- Cabin altitude (ALT);
- Cabin rate of climb or descent (RATE); and
- Differential pressure (ΔP).

The CPAM also provides the DCUs with data to generate the following EICAS messages:

- **CABIN ALT** caution message when cabin altitude between 8,500 and 10,000 ft;
- **CABIN ALT** warning message when cabin altitude exceeds: 10,000 ft during low-altitude airfield operation, or 14,000 ft during high-altitude airfield operation;
- **DIFF PRESS** warning message when cabin pressure differential exceeds 9.0 psid.

If PASS SIGNS switches are selected to AUTO, the CPAM will cause the NO SMKG and SEAT BLTS signs to illuminate when the airplane's cabin altitude exceeds 10,000 feet.

The CL–605 has two CPAMs installed (CPAM 1 and CPAM 2). For the following parameters (cabin altitude, cabin altitude rate of change and cabin differential pressure), the DCU uses the highest value between CPAM 1 and CPAM 2 for its logic as a source of information.

If either CPAM 1 or CPAM 2 fails, the **EICAS CPAM FAULT** status message will be displayed. However, if both CPAM 1 and CPAM 2 fail, the **CPAM FAIL** caution message is displayed, and all of the above functions will be lost.

NOTE

Failure of the CPAM does not affect the operation of the cabin pressure controller.

Cabin Pressure Controller (CPC)

The cabin pressure controller (CPC) uses a preprogrammed schedule to automatically regulate cabin pressure. The CPC receives and processes inputs from the S3 static port (ambient pressure), cabin pressure acquisition module (CPAM), cabin pressurization selector, thrust levers, and weight-on-wheels relays to control pressurization by electrically controlling outflow valves.

During automatic mode operation, the flight crew tasks are normally limited to selection of a landing field elevation prior to takeoff, and ensuring that the proper barometric correction is made before landing.

If the CPC fails, both outflow valves will go to an isobaric hold mode to maintain the existing cabin altitude. When a CPC failure occurs, the **AUTO PRESS** caution EICAS message appears, the amber FAULT light located on the cabin pressure selector and the FAIL annunciator on the PRESS CONT switch/light illuminate.

PRESSURIZATION SYSTEM (CONT'D)

Outflow Valves

Dual, redundant, electropneumatic, poppet-type outflow valves, identified as primary and secondary, are installed on the aft pressure bulkhead to regulate the overboard discharge of cabin and cockpit air. The outflow valves are spring-loaded closed, and modulate open when vacuum pressure is applied to an internal diaphragm. A jet pump, fed by 10th-stage bleed air, uses venturi action to provide a source of vacuum to operate the primary and secondary outflow valves, for both automatic (electropneumatic) and manual (pneumatic) operation.

Both primary and secondary outflow valves are slaved through a pneumatic line. The outflow valves respond to electrical control signals in the automatic mode, or pneumatic inputs via the manual regulators on the CABIN PRESSURIZATION panel in manual mode.

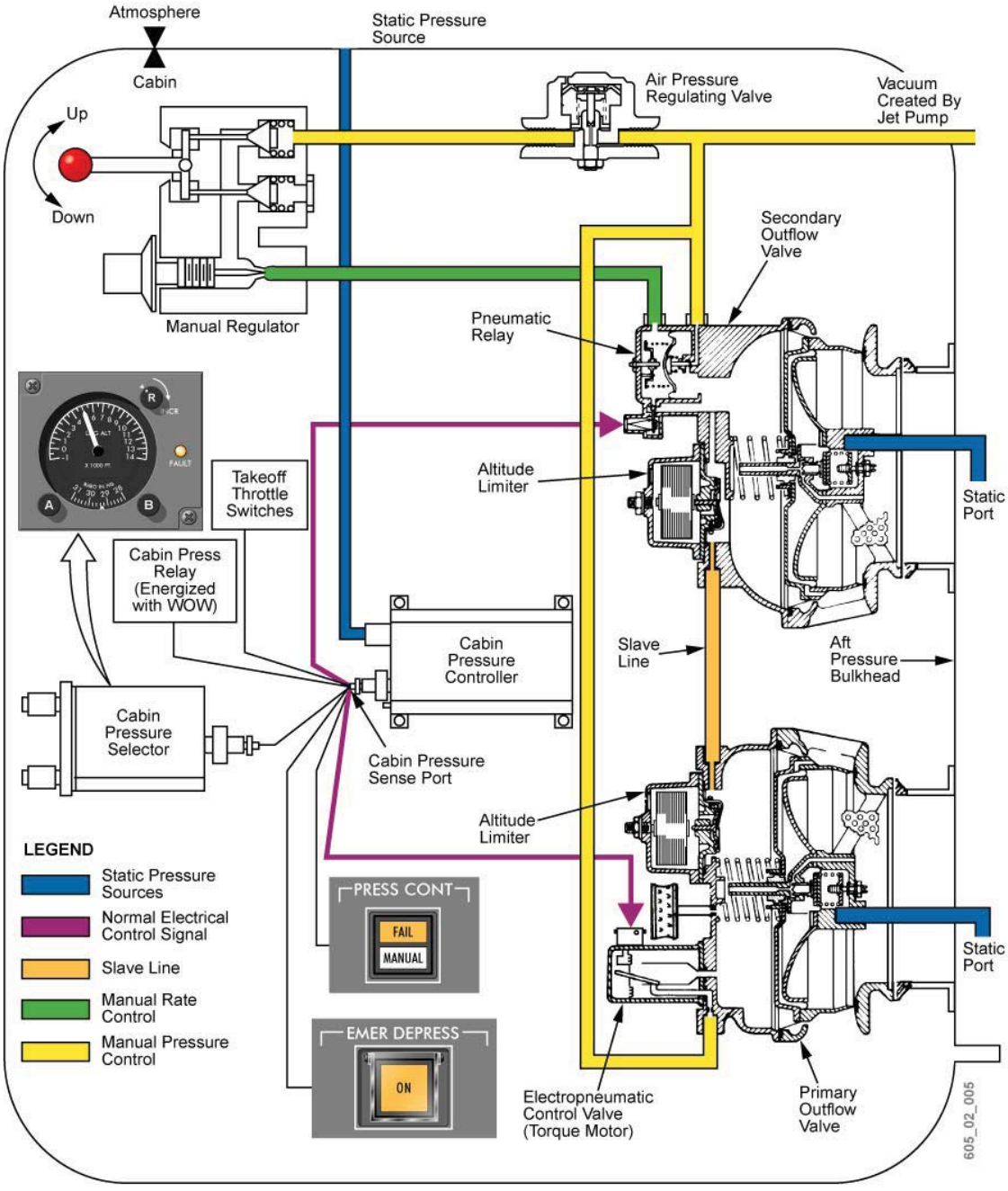
Automatic Mode

In automatic mode, the outflow valves are electropneumatically controlled and operated to set and maintain the aircraft pressurization schedule. The CPC provides electrical commands which regulate the amount of vacuum applied in order to modulate the opening of the primary outflow valve. The secondary valve is slaved to the primary outflow valve.

Manual Mode

In manual mode, pressurization is controlled by manually varying the amount of vacuum sent to the secondary outflow valve. The primary valve is slaved to the secondary outflow valve.

PRESSURIZATION SYSTEM (CONT'D)



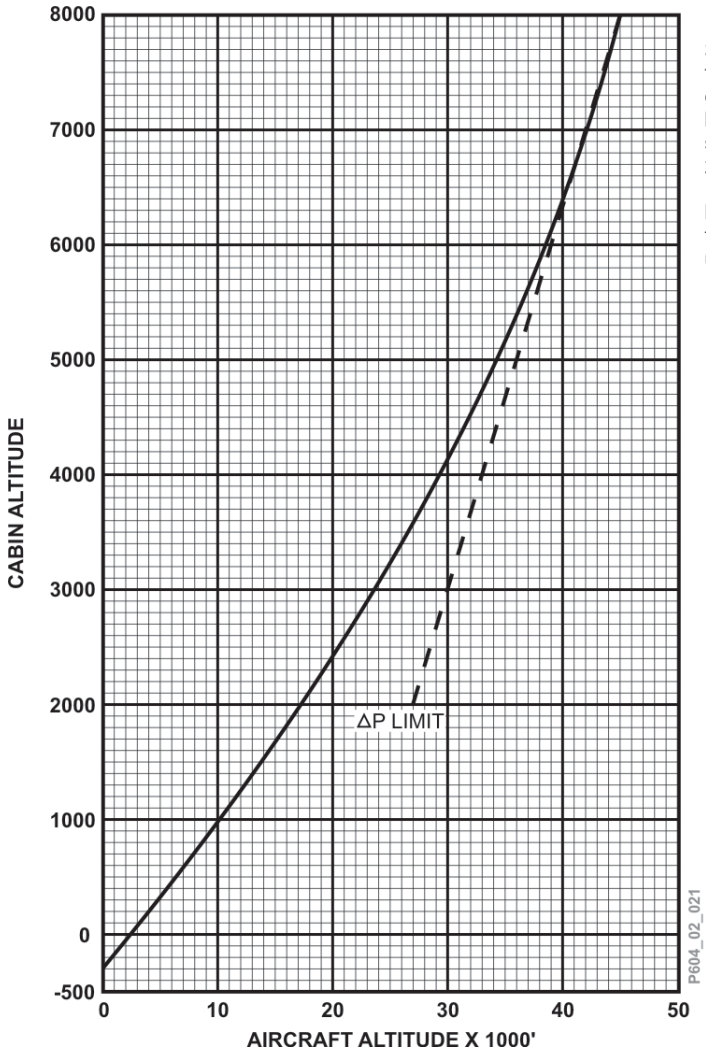
Cabin Pressurization Schematic
Figure 02–10–5

PRESSURIZATION SYSTEM (CONT'D)

Differential Pressure Schedule

The outflow valves operate to maintain a differential pressure from 0 to 8.8 psid, according to a predetermined schedule. Should a differential pressure of 9.1 ±0.1 psid be sensed, the outflow valves will automatically open to relieve excess pressure. Whenever the cabin differential pressure exceeds 9.0 psid, the **DIFF PRESS** warning EICAS message will be displayed.

Should pressure of the fuselage reduce to –0.5 psid, the outflow valves will automatically open to equalize the pressure.



For example, at an aircraft altitude of 35,000 feet, the cabin altitude as per the autoschedule is 5,200 feet. The controller will also monitor the selected landing altitude. If the landing altitude selected is less than 5,200 feet (say 2,000 feet) the controller will ignore it. However, if cabin altitude is selected higher than 5,200 feet (say 6,000 feet) the controller will drive cabin altitude up to the higher altitude (6,000 feet).

Cabin Pressurization Schedule
Figure 02–10–6

Emergency Depressurization

Selecting EMER DEPRESS overrides both automatic and manual control of the outflow valves. Electric signals from the EMER DEPRESS switch command both outflow valves to open, in order to rapidly depressurize the aircraft.

PRESSURIZATION SYSTEM (CONT'D)

Cabin Altitude Limiter

Each outflow valve includes an altitude limiter to prevent the cabin altitude from exceeding a preset limit.

If cabin altitude reaches approximately 14,500 ±500 feet, the altitude limiter closes the outflow valves to maintain the cabin altitude at 14,500 ±500 feet, provided sufficient air is entering the cabin to maintain this level.

Pressure Differential Diaphragms

Pressure differential diaphragms are incorporated into the cabin floor structure, to prevent floor buckling in the event of rapid decompression or emergency depressurization. The diaphragms open to equalize floor pressure when the difference in pressure between the overfloor and underfloor areas exceeds 3 psid.

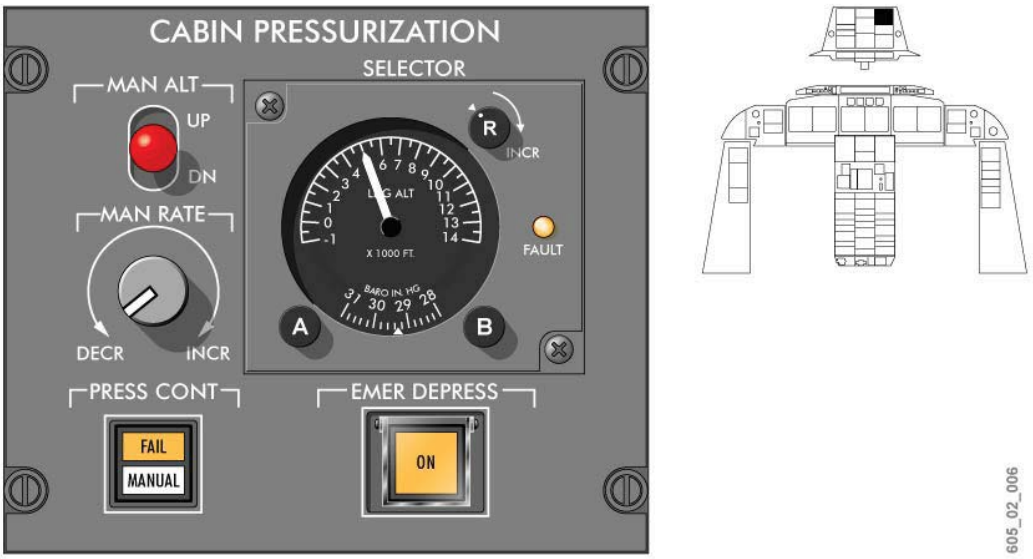
Cabin Pressurization Panel

The automatic and manual pressurization controls are located on the overhead CABIN PRESSURIZATION panel. Pilot input to the cabin pressure controller for automatic mode operation is made through the cabin pressure selector, which includes:

- Landing field elevation (A knob);
- Landing field barometric pressure (B knob); and
- Cabin altitude rate-of-change (R knob).

A yellow FAULT light illuminates to indicate automatic pressurization system failure.

The PRESS CONT switch/light allows selection of manual or automatic control of the pressurization system. Cabin pressurization in manual mode is accomplished by the MAN ALT and MAN RATE controls.



CABIN PRESSURIZATION Panel
Figure 02–10–7

PRESSURIZATION SYSTEM (CONT'D)

Cabin Pressurization Operation

The normal operating mode is automatic, where cabin altitude is maintained at a control value determined by the CPC, from the highest of the destination airport elevation or the cabin pressure schedule. Each flight segment has an automatic operating mode as explained below.

The alternative mode of operation is manual, where the crew manually selects and controls cabin altitude.

Ground Mode

The ground mode drives both outflow valves fully open, to provide maximum ventilation on the ground.

Prepressure Mode

The prepressurization mode is activated when thrust levers are advanced to takeoff when the aircraft is on the ground. Prepressurizing the aircraft allows the outflow valves to achieve a controlling position prior to takeoff. This eliminates any noticeable pressure bumps. The cabin is pressurized between –150 to –200 feet below airfield elevation at the selected rate limit (approximately 300 feet per minute at the “pip” mark (▼)).

Takeoff Abort Mode

The takeoff abort mode is entered when the thrust levers are retarded during a rejected takeoff. The cabin altitude climbs back to field elevation at 500 feet per minute for 20 seconds, then the outflow valves are driven fully open. Ground mode is then re-established.

Flight Mode

Flight mode is entered when the CPC receives a weight-off-wheels signal from the PSEU. A fixed schedule of cabin altitude versus aircraft altitude is used to establish cabin pressurization. The CPC selects whichever is higher, selected landing field elevation or fixed schedule, as the control value, then either maintains or drives cabin altitude toward this control value.

With the auto RATE knob selected at the “pip” mark , the cabin rate will climb at a rate of 500 feet per minute up, or descend at a rate of 300 feet per minute down.

Should pressure of the fuselage reduce to –0.5 psid, the outflow valves will automatically open to equalize the pressure.

Flight Abort Mode

The flight abort mode is set by the CPC when:

- Less than 10 minutes have elapsed since takeoff;
- Aircraft has climbed less than 6,000 feet; and
- Descent is detected by the CPC (aircraft descends by more than 1,000 feet from its maximum altitude).

When the CPC sets the flight abort mode, it automatically drives the cabin altitude to takeoff field elevation at the selected up/down rate.

PRESSURIZATION SYSTEM (CONT'D)

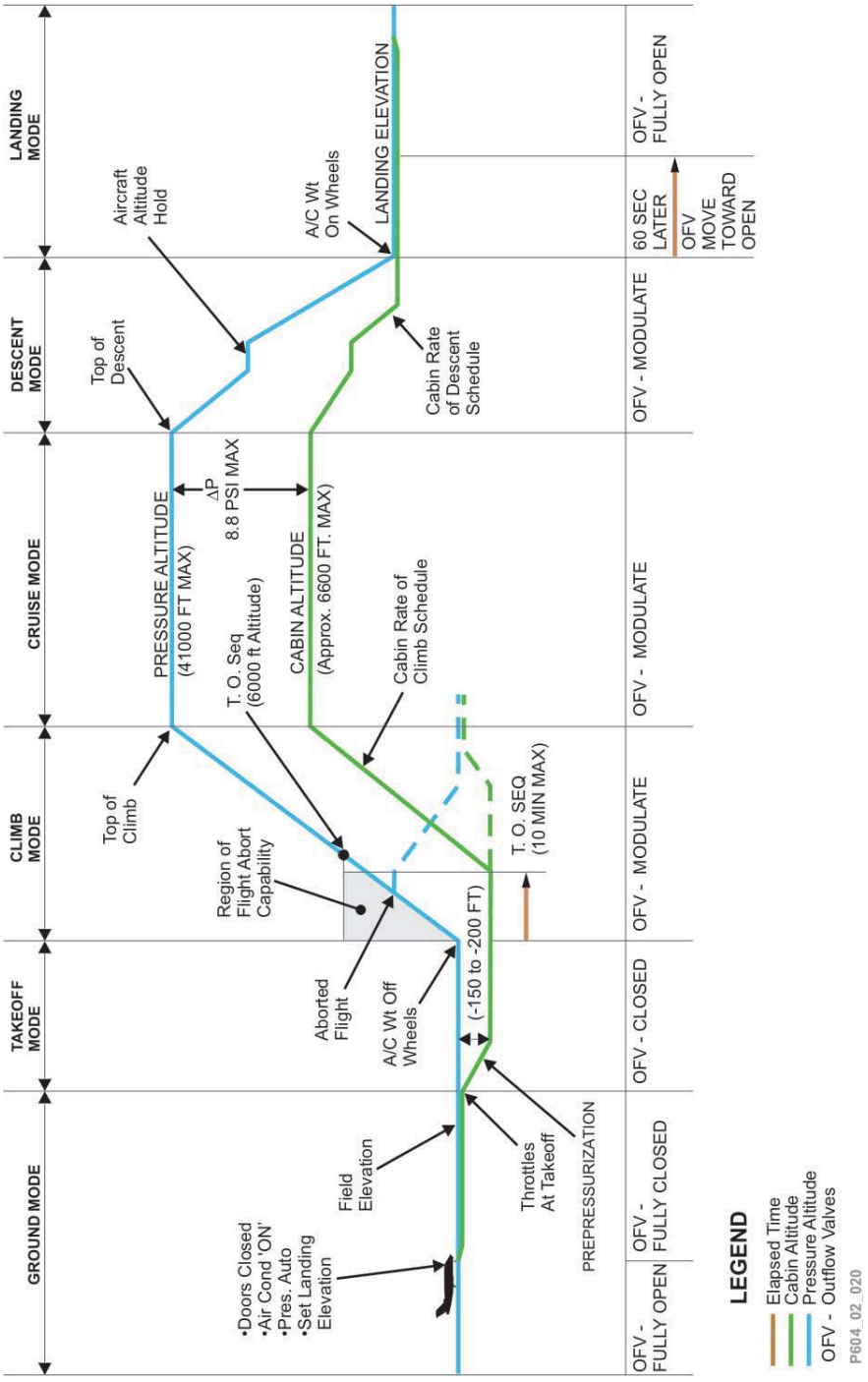
Landing Mode

The landing mode is entered when the CPC receives a weight-on-wheels signal from the PSEU, and the thrust levers are at idle. The cabin altitude is driven up at the selected rate for 60 seconds, and then the CPC reverts to ground mode (outflow valves are driven fully open).

Touch-and-Go Mode

On airplane touchdown, the system will assume landing mode. As the thrust levers are advanced, the system will schedule prepressure mode.

PRESSURIZATION SYSTEM (CONT'D)



Typical Flight Pressurization Profile
Figure 02–10–8

PRESSURIZATION SYSTEM (CONT'D)

High-Altitude Airfield Mode

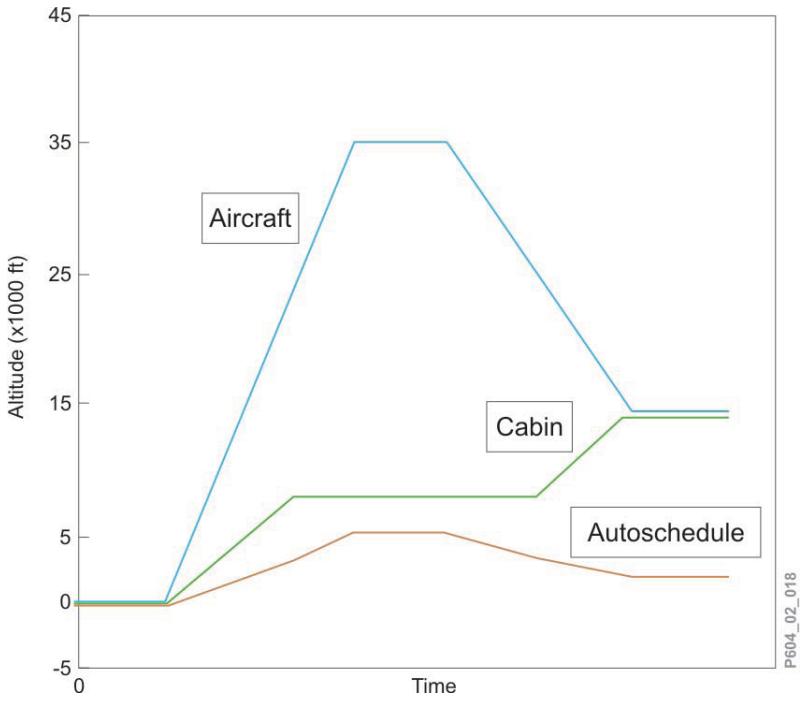
The CPC includes a high-altitude airfield mode to support aircraft operation up to a maximum airport pressure altitude of 14,000 feet MSL.

During takeoff and landing at airport pressure altitudes above 8,000 feet, the CPC reduces the time at which cabin altitude exceeds 8,000, feet as explained below:

Operation to a High-Altitude Airfield (Above 8,000 feet)

When a landing field elevation above 8,000 feet is selected, the CPC will schedule cabin altitude versus aircraft altitude as follows:

- Climb phase: After takeoff, the CPC uses 8,000 feet as the control point. With the auto RATE knob selected at the “pip” mark, the cabin rate will climb at a rate of 500 feet per minute up until it reaches 8,000 feet.
- Cruise phase: The CPC maintains the cabin altitude at 8,000 feet.
- Landing phase: When the aircraft is in descent, and aircraft altitude is less than 25,000 feet MSL, the CPC will climb the cabin altitude to the selected landing field elevation at an increased rate (700 feet per minute at the “pip” mark). This altitude is maintained for the remainder of the flight.



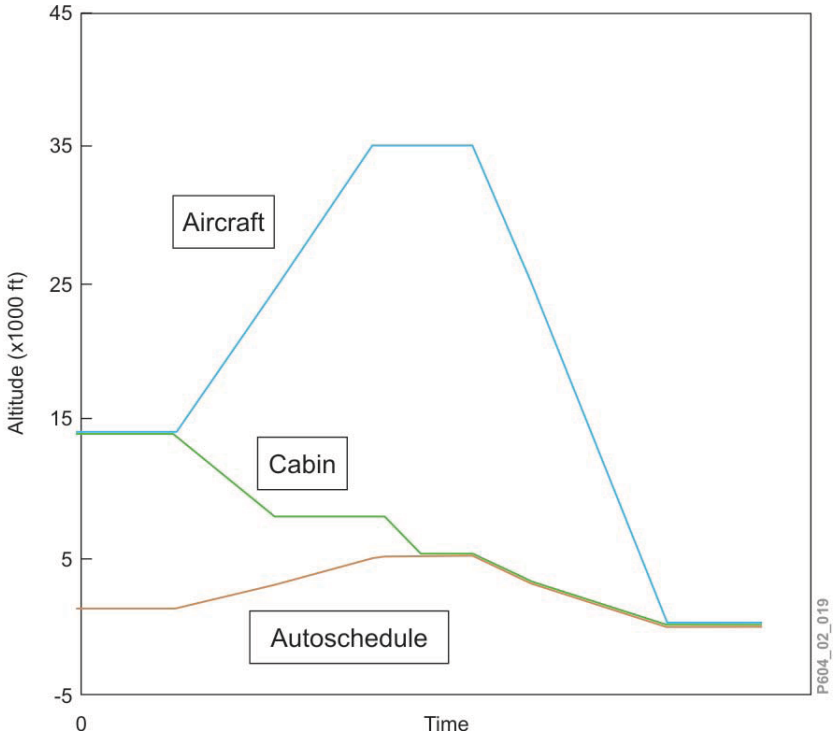
Takeoff at Sea Level to Land at 14,000 feet
Figure 02–10–9

PRESSURIZATION SYSTEM (CONT'D)

Operation from a High-Altitude Airport (Above 8,000 feet)

When departing from an airport above 8,000 feet, the CPC will schedule cabin altitude versus aircraft altitude as follows:

- Climb phase: After takeoff, the CPC immediately sets the cabin altitude control point to 8,000 feet, and descends the cabin altitude at an increased rate (600 feet per minute with the auto RATE knob selected at the “pip” mark) until it reaches 8,000 feet.
- Cruise phase: The cabin altitude remains at 8,000 feet until the aircraft is established in cruise. The CPC then controls the cabin altitude toward the autoschedule control point at the selected rate.



Takeoff at 14,000 feet to Land at Sea Level
Figure 02–10–10

Operation From and To a High-Altitude Airport (Above 8,000 feet)

For operation from and to airfields above 8,000 feet, the cabin altitude profile can be obtained by combining Figure 02–10–9 and Figure 02–10–10.

Manual Pressurization Mode

When MANUAL is selected on the CABIN PRESSURIZATION control panel, the outflow valves are manually controlled. The MAN ALT lever and the MAN RATE knob on the CABIN PRESSURIZATION control panel are used to position the outflow valves. An UP selection on the MAN ALT lever will cause an increase in cabin altitude at the rate selected on the MAN RATE knob. A DN selection of the MAN ALT lever will cause the cabin altitude to decrease at the rate set by the MAN RATE knob. When the MAN ALT lever is released, it is spring-loaded to the neutral position, and the cabin altitude will be maintained regardless of changes to the aircraft altitude.

PRESSURIZATION SYSTEM (CONT'D)

When manual pressurization is selected, pressurization data is reproduced on the EICAS page and the SUMMARY page.

CONTROLS AND INDICATORS

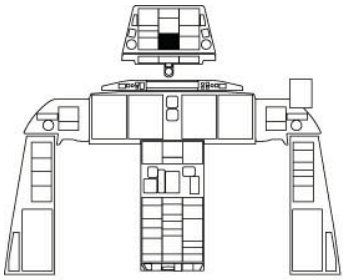
General

The air conditioning panel is located on the overhead panel, and has separate cockpit and cabin controls that can be operated in normal, standby and manual modes.

Warning, caution, advisory and status messages are presented on the Engine Indication and Crew Alerting System (EICAS). Cabin temperature and pressurization information are also presented through EICAS.

The pressurization control panel is located on the overhead panel, and has automatic and manual methods for controlling the airplane's cabin pressure.

Air Conditioning System



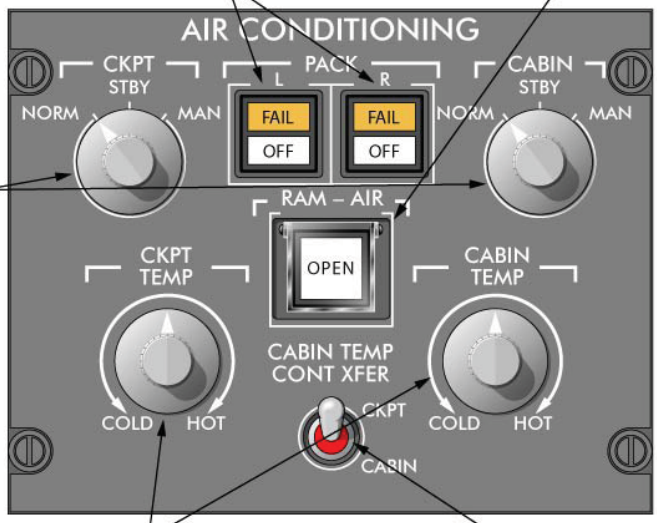
L (R) PACK Switch/Light
(alternate-action)
Opens associated pack pressure regulating shutoff valve.
OFF Light
Illuminated – Indicates associated pack pressure regulating shutoff valve is closed.
FAIL Light
Illuminated – Indicates associated pack failure (overtemperature, overpressure, pack pressure regulating shutoff valve failed open).

RAM-AIR Switch/Light
(guarded, alternate-action)
Opens ram air shutoff valve.
OPEN Light
Illuminated – Indicates ram air shutoff valve is open.

CKPT and CABIN Temperature Mode Selector
NORM:
- Provides automatic control of temperature in selected compartment using fan and duct sensor inputs
- Selectable temperature range is from 15ºC to 32ºC (60ºF to 90ºF)

STBY:
- Provides automatic control of supply air temperature in selected compartment using duct sensor inputs only
- Selectable supply air temperature range is from 2ºC to 82ºC (35ºF to 180ºF)

MAN:
- Provides manual control of temperature in selected compartment



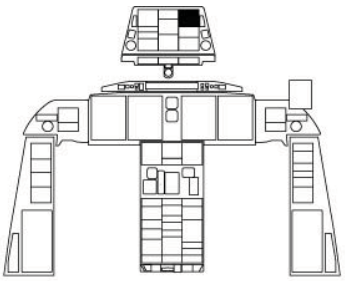
CKPT and CABIN Temperature Selector Rotate:
- Selects desired temperature in selected compartment
- Temperature range is dependent on selected mode

CABIN TEMP CONT XFER Switch
CABIN – Transfers the control of the cabin temperature to the Cabin Electronic System (CES).
CKPT – The cockpit has control of temperature settings of the cabin.

AIR CONDITIONING Panel
Figure 02–10–11

CONTROLS AND INDICATORS (CONT'D)

Pressurization System



Airport Elevation Selector and Pointer
Rotate:
- Adjusts landing airport elevation
- Range is from -1,000 to 14,000 ft

Rate Selector
Rotate:
- Adjusts the cabin rate of climb and descent commanded by the Cabin Pressure Controller (CPC)
- Selectable from 0-2500 FPM UP and 0-1500 FPM DOWN
- "Pip" position (▲) corresponds to 500 FPM UP and 300 FPM DOWN

MAN ALT Selector
(spring-loaded to the center position)
UP – Commands cabin climb when in manual mode.
DOWN – Commands cabin descent when in manual mode.

MAN RATE Selector
Rotate – Adjusts cabin climb and descent rate when in manual mode.

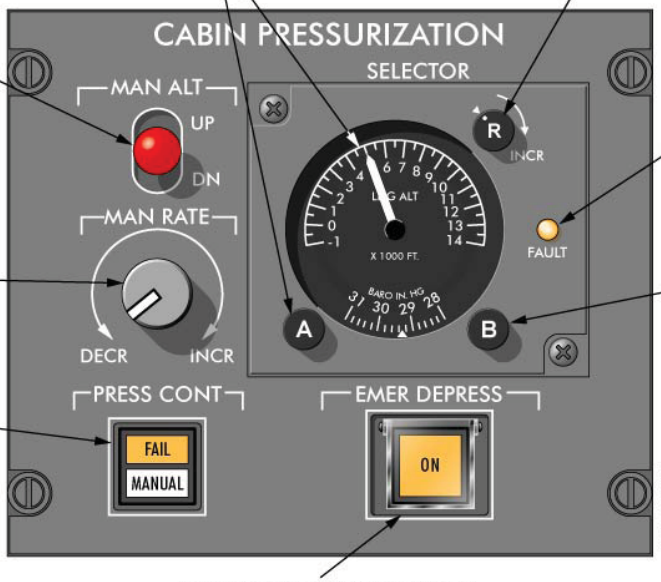
PRESS CONT Switch/Light
(alternate-action)
Selects manual pressurization mode.
MANUAL Light
Illuminated – Indicates manual pressurization mode is selected.
FAIL Light
Illuminated – Indicates Cabin Pressure Controller (CPC) failure.

FAULT Light
Illuminated – Indicates Cabin Pressure Controller (CPC) failure.

Barometric Selector and Pointer
Rotate – Adjusts landing airport barometric pressure in inches Hg.

EMER DEPRESS Switch/Light
(guarded, alternate-action)
Commands both outflow valves to full open.
ON Light
Illuminated – Indicates EMER DEPRESS switch/light has been selected.

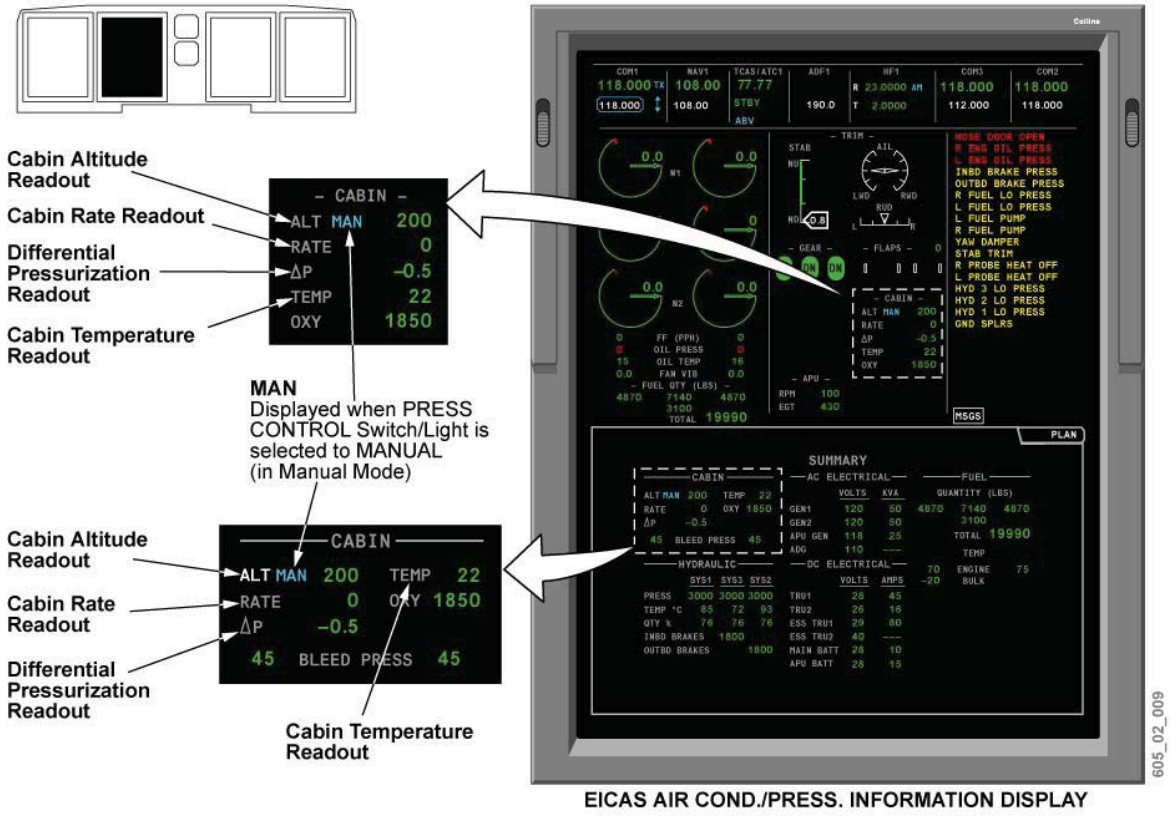
Note: Cabin altitude will increase up to the cabin altitude limiter set point.



CABIN PRESSURIZATION Panel
Figure 02–10–12

CONTROLS AND INDICATORS (CONT'D)

EICAS Page and SUMMARY Page



EICAS AIR COND./PRESS. INFORMATION DISPLAY

Air Conditioning and Pressurization Indications
Figure 02–10–13

CONTROLS AND INDICATORS (CONT'D)

Description	Symbol	Condition
Cabin Altitude Readout	3100	Cabin pressure altitude is less than 8000 ft MSL
	8700	Cabin pressure altitude is greater than 8500 ft MSL and less than 10,000 ft MSL, during low-altitude airfield operations
	10500	Cabin pressure altitude is greater than 10,000 ft MSL during low-altitude airfield operations, or Cabin pressure altitude is greater than 14,500 ft MSL during high-altitude airfield operations
	-----	Invalid data
Cabin Rate Readout	↑500	Indicates rate of change in feet per minute (increments in 100 fpm) and direction via arrow symbol
	-----	Invalid data
Cabin Temperature Readout	4.2	Cabin to ambient differential pressure is less than 9.0 psid
	9.1	Cabin to ambient differential pressure is greater than 9.0 psid
	--	Invalid data
Differential Pressure Readout	20	Indicates current cabin temperature (°C)
	--	Invalid data

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Air Conditioning and Pressurization Indications
Figure 02–10–14

EICAS MESSAGES

MESSAGE	MEANING	AURAL WARNING (IF ANY)
CABIN ALT	Cabin pressure altitude is greater than 10,000 feet MSL during low-altitude airfield operations, or cabin pressure altitude is greater than 14,500 feet MSL during high-altitude airfield operations.	"CABIN PRESSURE"
DIFF PRESS	Cabin pressure differential is greater than 9.0 psid.	"WARNING" Triple Chime
AUTO PRESS	Automatic cabin pressurization has failed.	
CABIN ALT	Cabin pressure altitude is greater than 8,500 feet MSL and less than 10,000 feet MSL, during low-altitude airfield operations.	
CPAM FAIL	Both CPAM 1 and CPAM 2 have failed.	
EMER DEPRESS	Emergency depressurization switch/light has been activated.	
L PACK HI PRESS	Respective ACU pressure exceeded limits and shut down.	
R PACK HI PRESS		
L PACK HI TEMP	Respective ACU temperature exceeded limits and shut down.	
R PACK HI TEMP		

EICAS MESSAGES (CONT'D)

MESSAGE	MEANING	AURAL WARNING (IF ANY)
L PACK NOT OFF	Respective ACU is pressurized after being switched off.	
R PACK NOT OFF		
CABIN ALT WARN HIGH	High Altitude airfield takeoff or landing has been initiated.	
DISPLAY FAN FAIL	Avionics cooling fan is inoperative.	
CPAM FAULT	Failure of either CPAM 1 or CPAM 2.	

POWER SUPPLY AND CIRCUIT BREAKER SUMMARY

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Cabin Pressurization Control	Cabin Pressure Control	CABIN PRESS CONT	DC BATT	2	N5	
	Cabin Pressure Acquisition Module 1 (CPAM)	CPAM 1/EMER DEPRESS	DC ESS	4	B5	
	Cabin Pressure Acquisition Module 2 (CPAM)	CPAM 2	DC BUS 2	2	G5	
Air Conditioning	Left Pack	L AIR COND CONT	DC ESS	4	B9	
	Ram Air	RAM AIR SOV	DC BATT	2	P12	
	Right Pack	R AIR COND CONT	DC BUS 2	2	F9	
	Cabin Temperature Control	CABIN TEMP CONT LO LIM	DC BUS 2	2	E13	
		CABIN TEMP CONT MAN	DC BUS 2	2	E14	
		CABIN TEMP CONT AUTO	DC BUS 2	2	E15	
		CABIN TEMP SENSE	AC BUS 2	2	B13	
	Cockpit Temperature Control	CKPT TEMP CONT LO LIMIT	DC ESS	4	C9	
		CKPT TEMP CONT MAN	DC ESS	4	C10	
		CKPT TEMP CONT AUTO	DC BUS 1	1	E15	
		CKPT TEMP SENSE	AC BUS 1	1	C9	
Avionics Cooling System	Display Fans	DISPLAY FAN	AC BUS 1	1	C5	
	Display Fans	DISP FAN CONT	DC BUS 1	1	F1	
Foot Warmer System	Pilot and Copilot Foot Warmers	FOOT WARMER	DC UTILITY BUS 1	1	E1	