

1. GENERAL.

Bleed air from the engines and the APU is used for:

- Engine starting
- Air conditioning
- Cabin pressurization
- Boot de-icing
- Pressurization of the water tanks (if the optional two-tank system is installed).

A ground air unit can be connected to the system. It gives low-pressure air. As an option, a high-pressure air connection can be installed.

The systems are protected by sensors for overtemp and over/under-pressure, and relevant warning messages are given. The EICAS shows system status on the STAT, AIR and ICE pages, respectively. Some of the information overlaps.

The controls are on the overhead flight compartment panel, but the passenger cabin temperature can also be fine-tuned from the F/A panel.

2. MAIN COMPONENTS AND SUBSYSTEM.

2.1. Bleed Air System.

There is one high pressure (HP) and one low pressure (LP) bleed point on each engine compressor.

Bleed air from one engine is sufficient for all normal operations.

Pulling a fire handle will close the HP and LP valves.

For operation of the pneumatic de-icing system, see chapter 10, ICE AND RAIN PROTECTION.

2.2. Air Conditioning.

There are two airconditioning packs. The right pack supplies mainly the passenger compartment, and the left pack mainly the flight compartment.

The temperature may be controlled automatically or manually.

If one pack fails, the other pack gives conditioned air to both compartments.

If both packs fail, it is possible to get air via an ambient air (AMB AIR) inlet. In this case, the recirculation fans draw in the air.

NOTE
Do not operate two packs on one engine, it creates higher ITT thereby shortening engine life.

The AMB AIR function can also be used on the ground to get fresh air into the cabin when the engines and/or APU are not running, and there is no ground air unit connected.

The air temperature and airflow of the pilots' foot-warmers are controlled with selectors on each side-wall panel. The panels also have switches for the floor heater mats.

2.3. Pressurization.

The pressure can be controlled automatically or manually.

The manual back-up system is completely independent and has its own power supply and pressure sensor.

At 31 000 ft, the cabin altitude is about 7500 ft at max differential pressure. If the cabin climbs to 14,500 ft, the outflow valve that is used to regulate the pressure, closes (can be overridden by MANUAL mode).

The DUMP switch is used to emergency-dump the pressure.

After landing, the weight-on-wheels switches give a signal to the controller to open the outflow valve and depressurize the aircraft. However, in MANUAL mode, the pressure has to be dumped manually before landing.

All doors must be closed and locked for the system to activate.

The automatic system has six "flight modes":

- Ground
- Takeoff
- Climb
- Cruise
- Descent
- Abort.

Signals from Power Levers, door switches, landing gear switches and ADCs are used to activate these modes.

2.4. EICAS Indications.

The SED STATUS page shows these CAB PRESS parameters:

- ALT (Cabin altitude).
- RATE (cabin rate of change, digital readout and Analog Cabin Rate scale).
- DIFF (differential pressure).
- LDG ELV (landing field elevation).

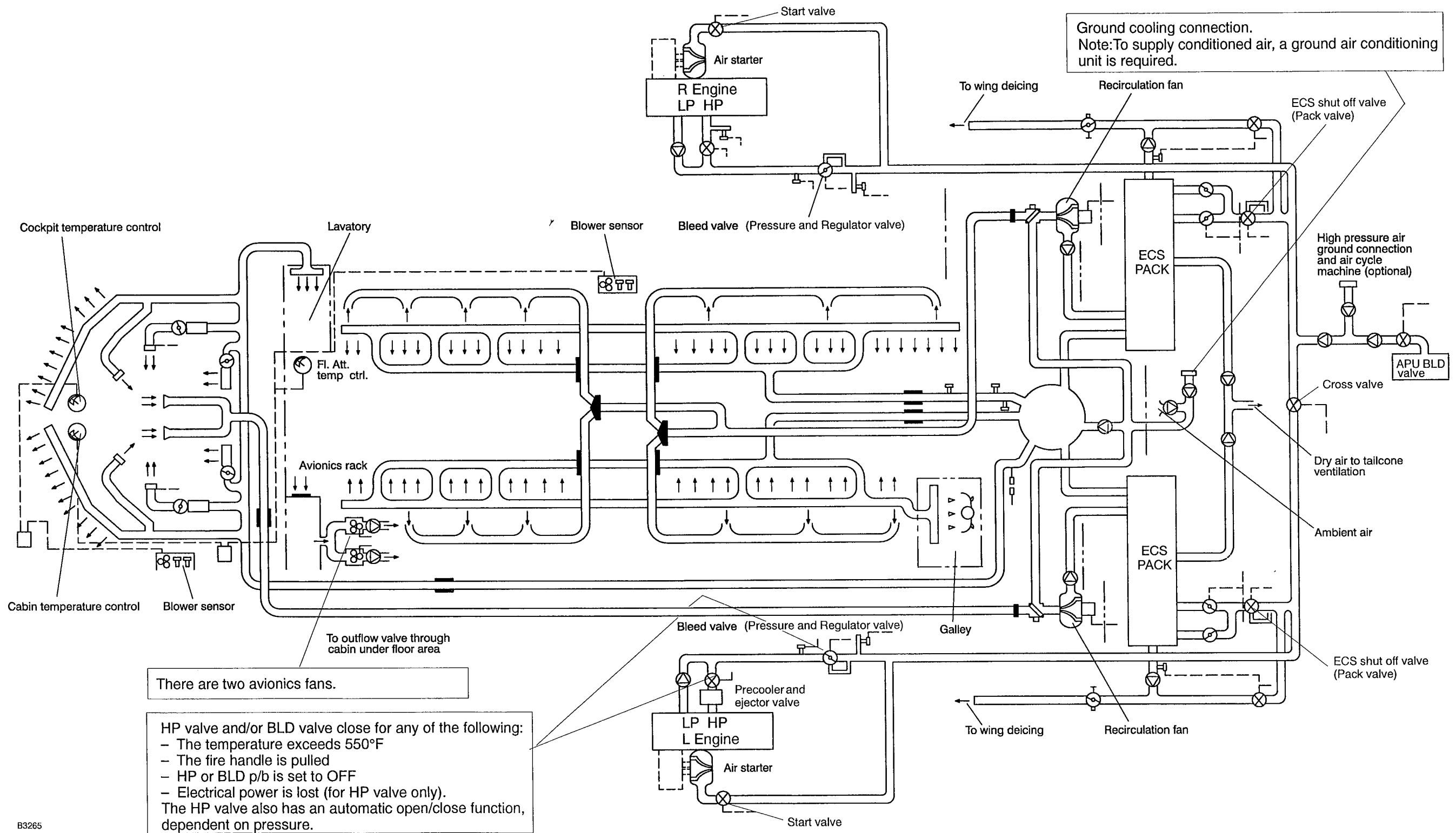
If the CAB PRESS AUTO FAIL caution comes on, the indications will change:

- ALT indicates down to – 2000 ft; below this value amber dashes will show instead
- DIFF pressure is lost; amber dashes will show instead
- LDG ELV information is lost; amber dashes will show instead.

In addition, the CAB DIFF PRESS HI warning is inhibited.

WARNINGS:

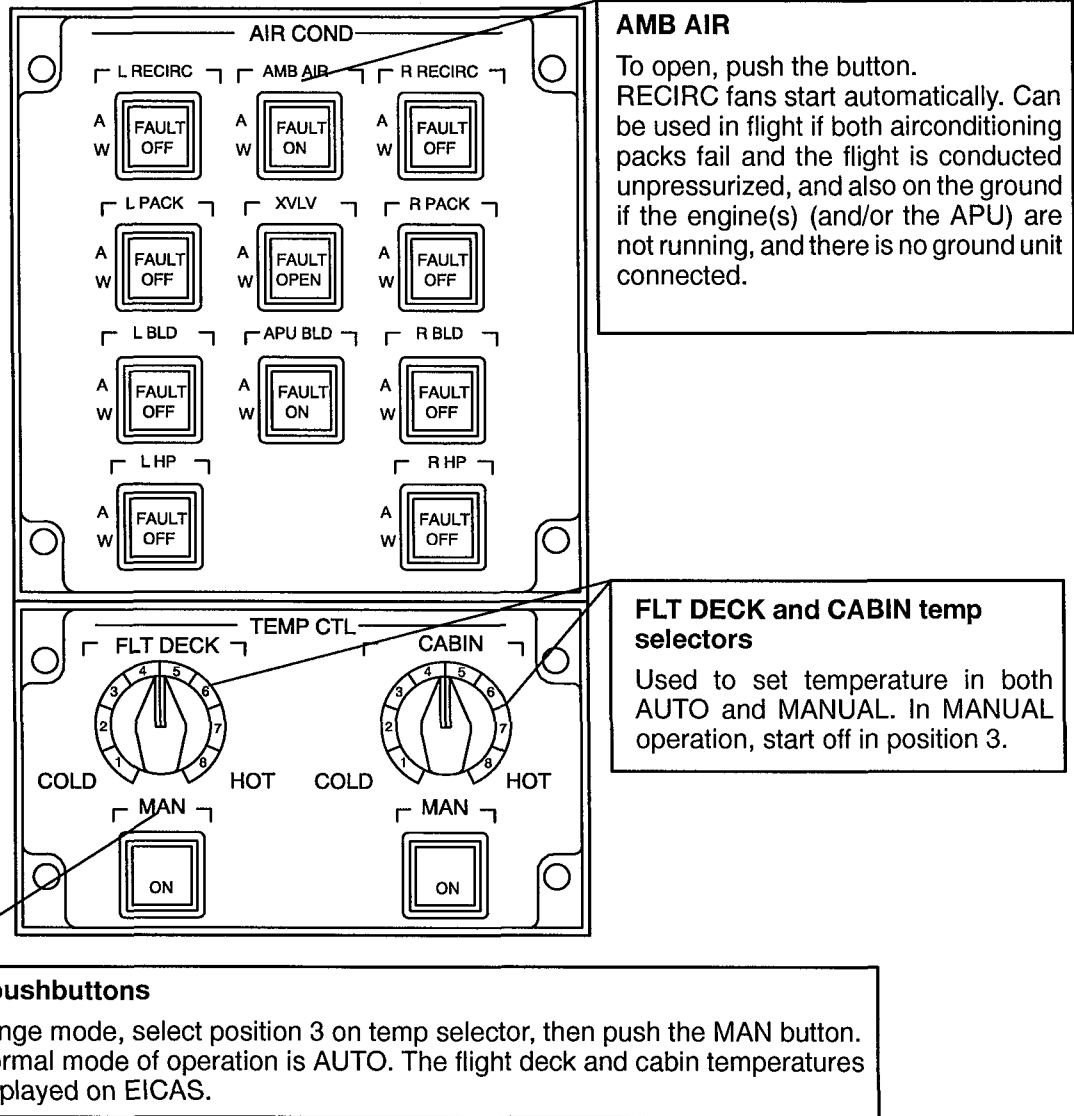
- CAB ALT HI comes on when cabin altitude exceeds 9600 ft.
- CAB DIFF PRESS HI comes on if cabin diff pressure is greater than 7.3 psi.



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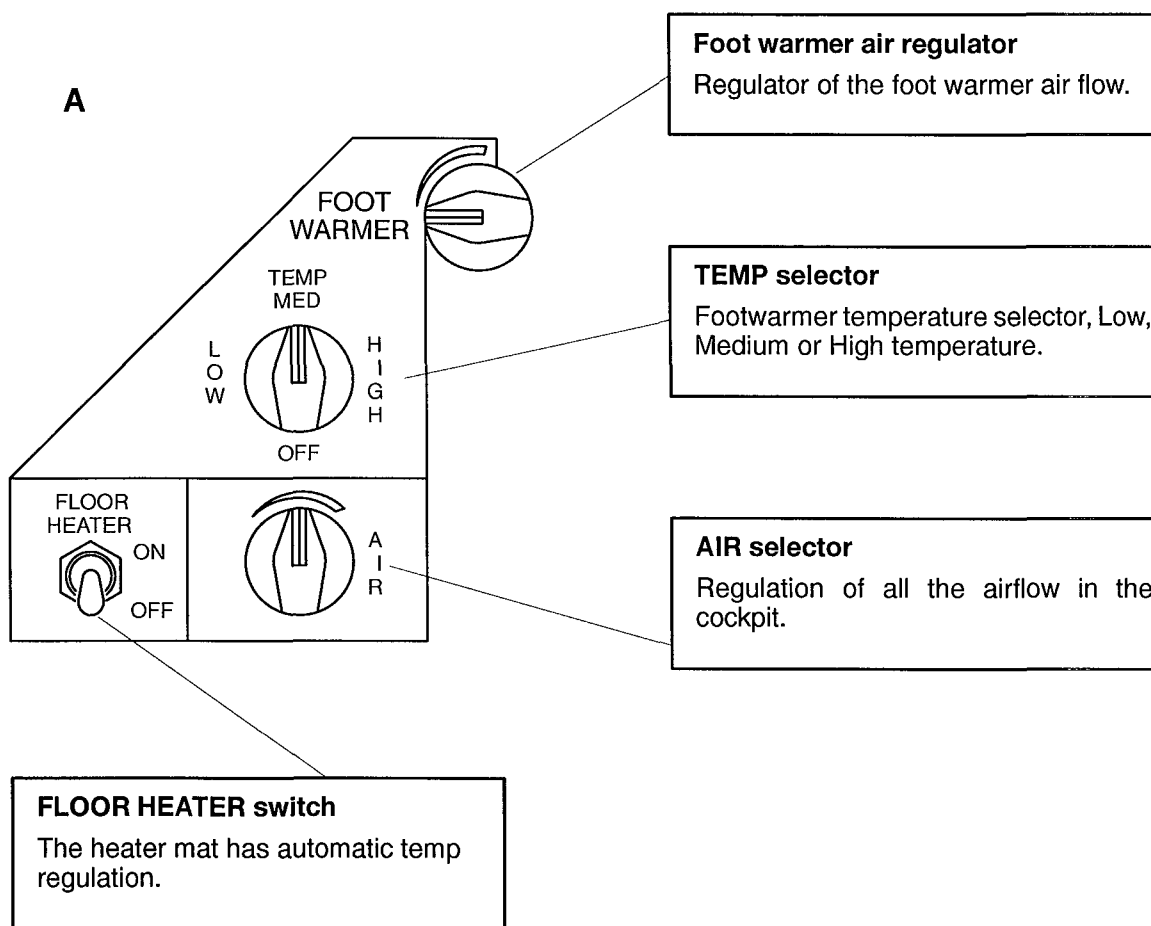
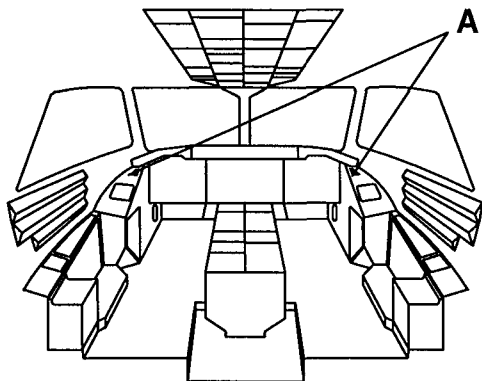
FIG.2. Air Conditioning System schematic.

3. CONTROLS AND INDICATORS.



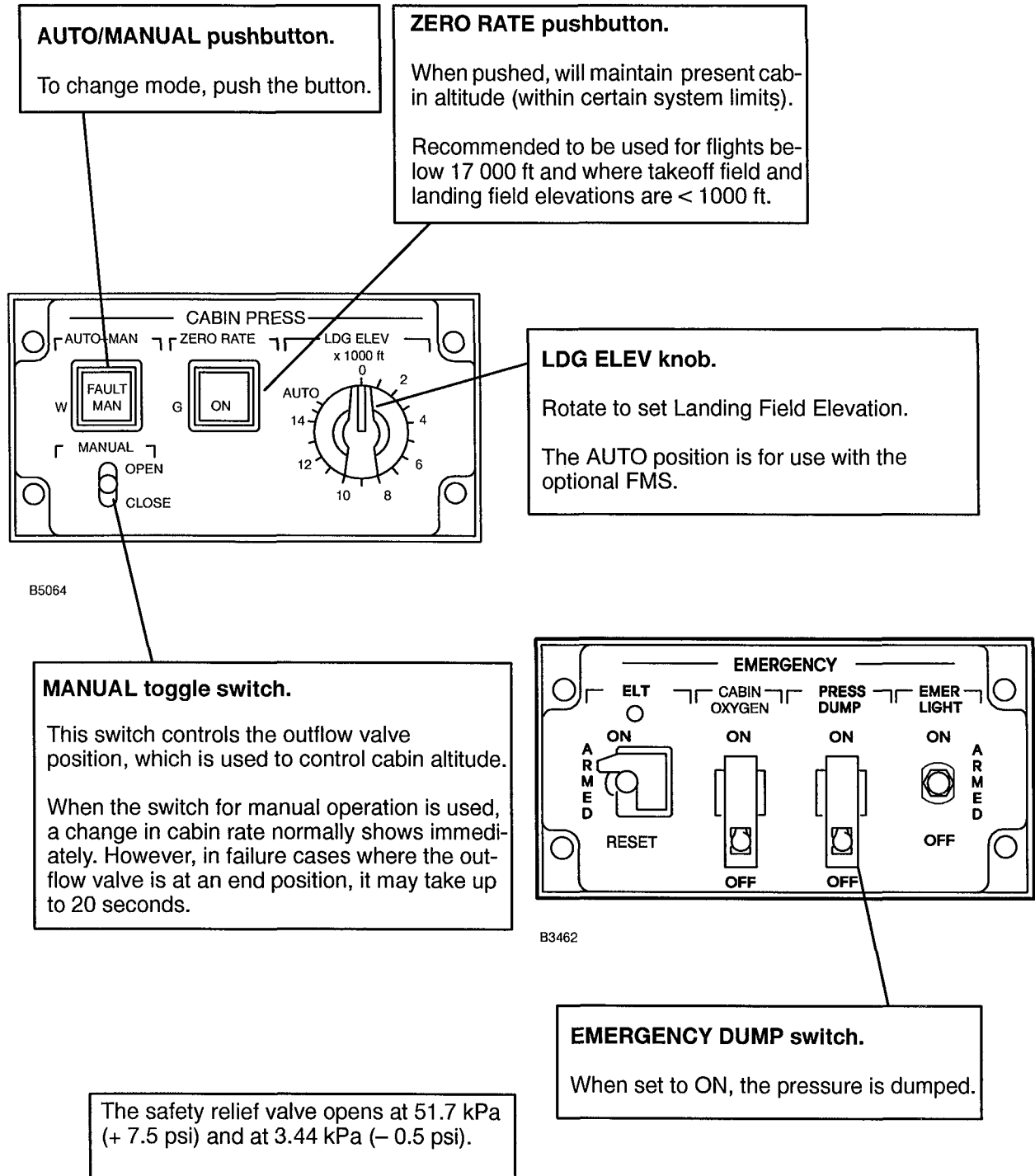
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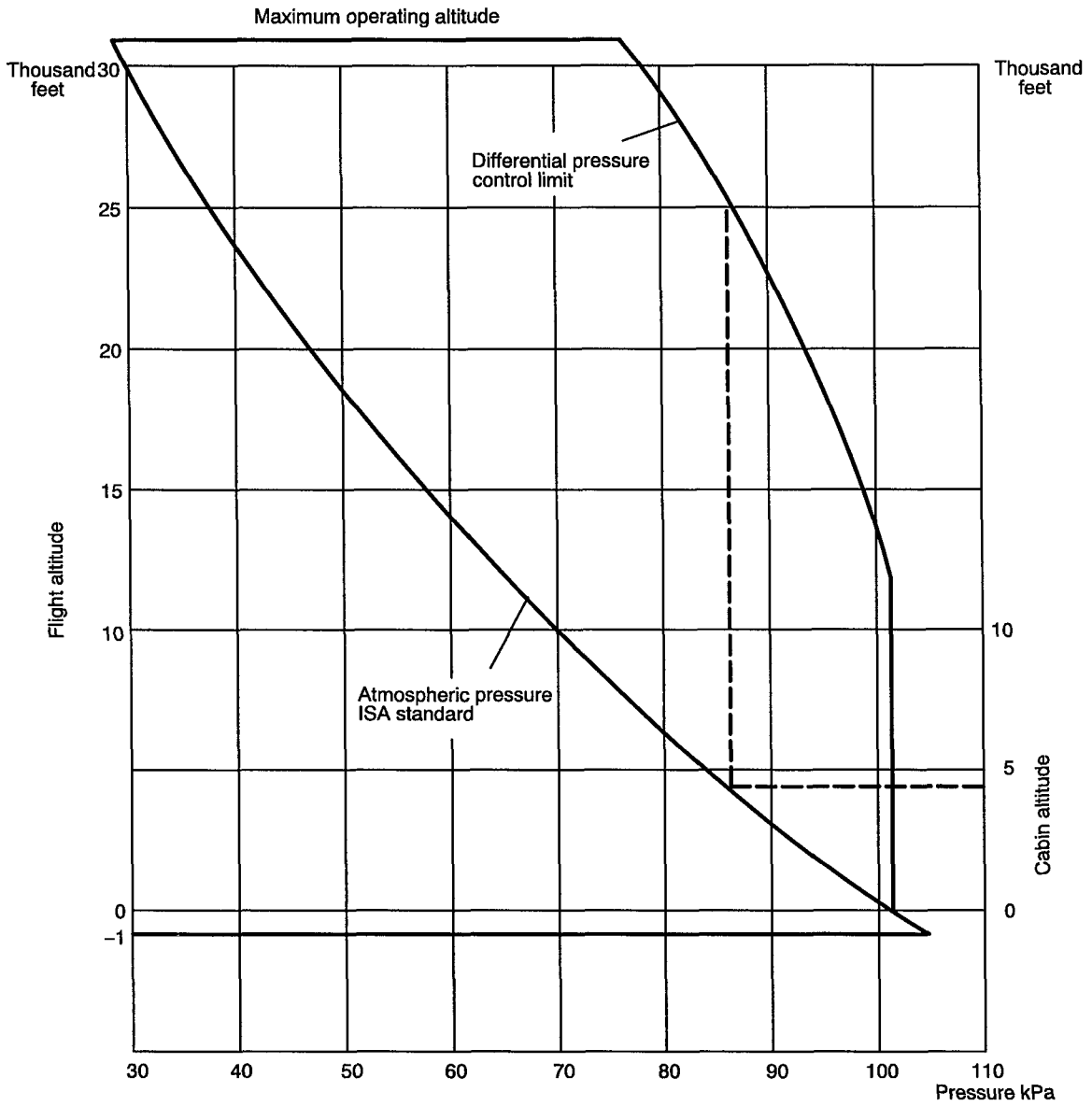
FIG. 3. Air Conditioning Controls.



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FIG. 4. Cockpit air and heater controls.



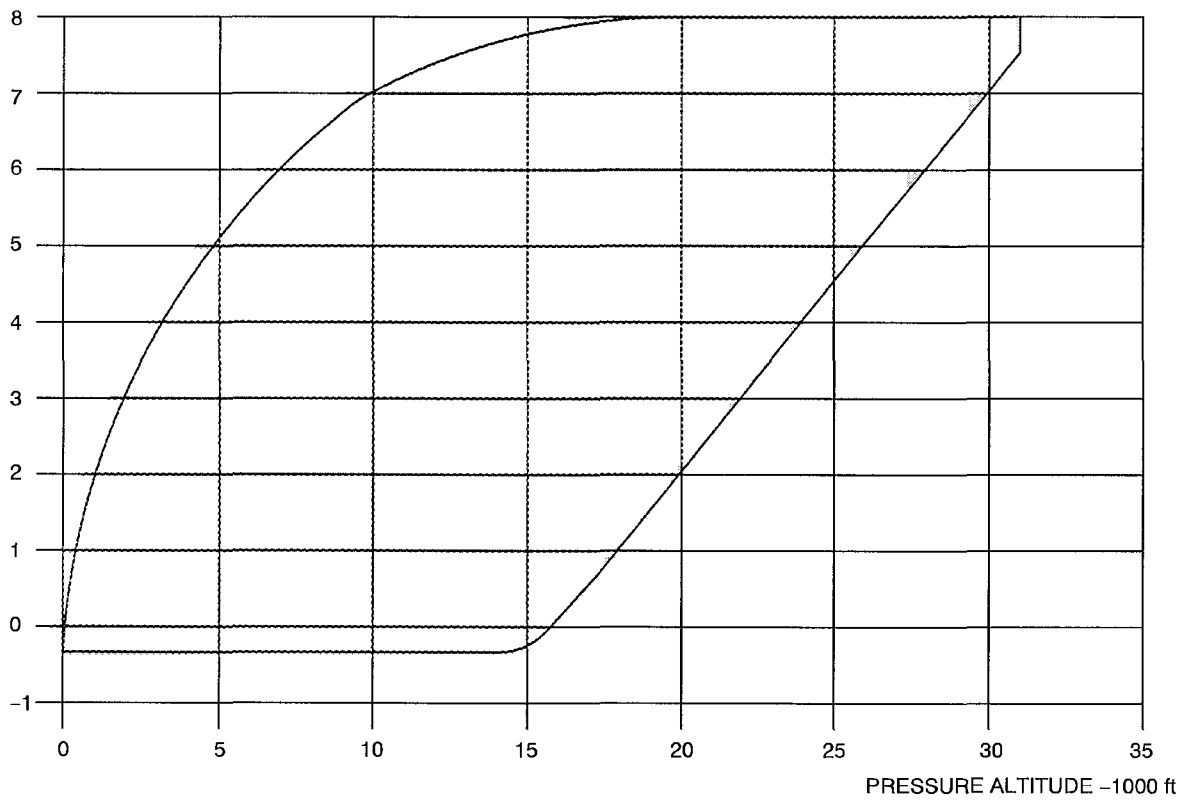


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FIG. 6. Cabin Pressure Schedule.

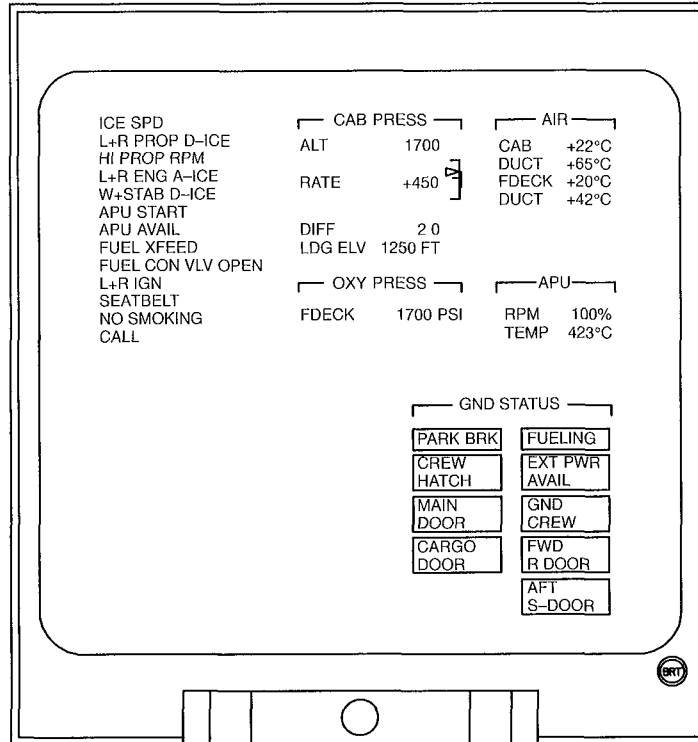
FLIGHT LEVEL	TARGET CABIN ALTITUDE
310	8000 – 7500
250	8000 – 5000
200	8000 – 3000
150	7000 – 0
100	7000 – 0
50	5000 – 0
< 50	Full open valve

CABIN ALTITUDE –1000 ft

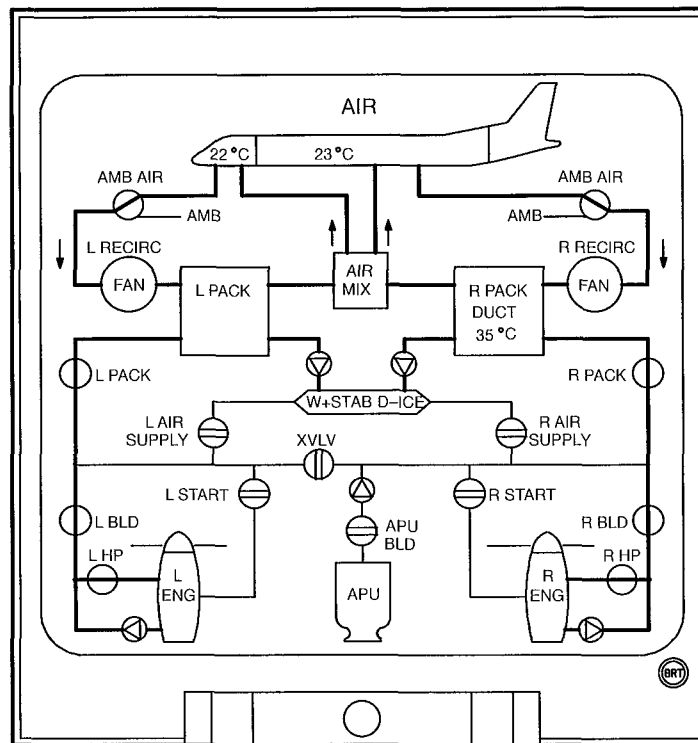


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FIG. 7. Manual Pressure Schedule.



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FIG. 8. STATUS and AIR pages.

4. ELECTRICAL POWER SUPPLY.

Pressurization

Cabin press control	R MAIN BUS	N 11	CABIN PRESS CTL
Cabin press emergency control . . .	L BAT BUS	G 9	CABIN PRESS EMER CTL

Air Conditioning

R Recirc fan cabin	R MAIN BUS	P 25	R RECIRC FAN
L Recirc fan flight deck	L MAIN BUS	H 25	L RECIRC FAN
Cabin temp auto	L MAIN BUS	P 19	AIR COND CABIN TEMP AUTO
Cabin temp manual	L MAIN BUS	H 19	AIR COND CABIN TEMP MAN
Flight deck temp auto	R MAIN BUS	H 18	AIR COND FLT DECK TEMP AUTO
Flight deck temp manual	R MAIN BUS	P 20	AIR COND FLT DECK TEMP MAN

Cross bleed valve	R BAT BUS	P 21	AIR COND XVLV
R Bleed valve	R MAIN BUS	H 20	AIR COND R BLD VLV
L Bleed valve	L MAIN BUS	P 22	AIR COND L BLD VLV
R High press auto	R MAIN BUS	P 23	AIR COND R HP AUTO
L High press auto	L MAIN BUS	H 21	AIR COND L HP AUTO
R High press manual	L BAT BUS	P 24	AIR COND R HP MAN
L High press manual	R BAT BUS	H 22	AIR COND L HP MAN

R Foot warmer	R MAIN BUS	R 24	R FOOT WARMER
L Foot warmer	L MAIN BUS	H 23	L FOOT WARMER

R Foot heater	R UTILITY BUS		
L Foot heater	L UTILITY BUS		

} Fuse located
outside cockpit