
Decompression at cruise altitude, American Trans Air, May 12, 1996

Micro-summary: This Boeing 727-290 experienced a decompression at 33,000 feet.

Event Date: 1996-05-12 at 2025 CDT


Investigative Body: National Transportation Safety Board (NTSB), USA

Investigative Body's Web Site: <http://www.nts.gov/>

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		NTSB ID: CHI96IA157		Aircraft Registration Number: N775AT	
		Occurrence Date: 05/12/1996		Most Critical Injury: Minor	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place INDIANAPOLIS		State IN	Zip Code 46241	Local Time 2025	Time Zone CDT
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 727-290		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>On May 12, 1996, at 2033 central daylight time, a Boeing 727-290, N775AT, operated as American Trans Air flight 406, experienced a decompression at 33,000 feet. The flight which was bound for St. Petersburg, Florida, made an emergency landing at the Indianapolis International Airport, Indianapolis, Indiana. The 14 CFR Part 121 flight was operating on an IFR flight plan. The airplane was not damaged. The three cockpit crewmembers did not report any injuries. Three of the five flight attendants on board reported minor injuries. Minor injuries were also reported by 8 of the 104 passengers. The flight originated from Midway Airport, Chicago, Illinois, at 2000 cdt.</p>					
HISTORY OF FLIGHT					
<p>This flight was the tenth hour of initial operating experience for the first officer who was flying the airplane during the leg of the trip. The flight crew stated that the preflight was normal and they made a maximum power takeoff with flaps set at 15 degrees. The captain and the flight engineer stated that both packs were on for the takeoff.</p>					
<p>The flight engineer stated that cabin pressure was between 2,500' and 3,000' during the climb. At 25,000' the cabin pressure differential was 3.0. While climbing out of 32,000' for 33,000' the cabin altitude warning horn sounded. The captain told the flight engineer to silence the horn. The flight engineer had trouble locating the silencer button and the captain pointed it out to him. While the captain was doing this he noticed the right pack was selected to the off position. The captain stated he tried to get the flight engineer to reinstate the pack. The cabin altitude continued to climb through 14,000' at which time the cabin altitude warning lights illuminated.</p>					
<p>The lead flight attendant was in the cockpit serving meals and the captain asked her to look back in the cabin and see if the oxygen masks had dropped. She stated she looked in the back and the masks were in fact down. She returned to the cockpit and informed the captain that the masks were down. She then leaned against the cockpit door, became unconscious, and slumped to the floor.</p>					
<p>The captain stated he recalled the flight engineer selecting "something" on the panel after the cabin altitude warning light illuminated. The flight engineer stated he turned the right pack on, selected manual AC, closed the outflow valve and checked the temperatures. He stated he recalled seeing the cabin pressure at 16,000' when he switched the pack on. He stated the cargo heat outflow valve was in the "normal" position and he did not think of closing it. It was at this time the captain recalled feeling an "air surge" at which time he reached for his mask. He recalled pulling the mask away from the strap but not putting it over his face.</p>					
<p>The first officer stated he donned his oxygen mask when the cabin altitude warning horn sounded. He stated he then felt a "tremendous rush of air" and he switched to emergency oxygen flow for his mask. He stated that at this time they had lost most of if not all of their cabin pressure. He also stated that from the time the horn sounded until he felt the rush of air was less than a</p>					
FACTUAL REPORT - AVIATION					

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minute.

The flight engineer stated he donned his oxygen mask when the cabin altitude warning light illuminated indicating the masks had dropped in the cabin. Shortly thereafter, he selected emergency oxygen flow to his mask.

The first officer stated he initiated an emergency descent at cruise airspeed which resulted in a 4,000 to 5,000 foot per minute (fpm) descent. He stated he accomplished this by disconnecting the autopilot, bringing the power levers to idle, deploying the speed brakes, and turning on the auto ignition. He stated that he did not put the airplane in a more rapid descent because he was unsure of the reason for the decompression and in case there was structural damage he did not want to overstress the airplane. He stated that he attempted two or three times to declare an emergency with air traffic control, but his transmissions were garbled using the oxygen mask microphone, so he began pulling the mask from his face to use the hand mike. He stated he declared an emergency and was given vectors for a landing at Indianapolis. He stated that when questioning the captain during this time, he was not getting "normal responses" in return. He then looked at the captain and noticed he was sitting upright in his seat with his head tilted to the left. He stated the captain's oxygen mask was partially on his face.

Simultaneous with the loss of pressure, the flight engineer got out of his seat and placed the second observer jumpseat oxygen mask on the flight attendant. He stated his oxygen mask got pulled from his face when he was reaching for the observer mask, but he repositioned his mask prior to placing the mask on the flight attendant. He stated that within 30 seconds she started to come around and was pointing to her mask. She eventually took the mask off her face and became ill in the cockpit. He stated she was adamant about going into the cabin area to check the passengers, but he instructed her to sit in the cockpit jumpseat for awhile. The flight engineer stated that his next recollection was being below 10,000', looking up and seeing both pilots flying the airplane and the runway lights at Indianapolis.

The flight attendant recalled being "light-headed." The next thing she remembered was waking up on the floor of the cockpit with the flight engineer standing over her "giving her the thumbs up." She stated he had apparently put an oxygen mask on her face and that he also had his mask on at this time. She stated she got up off the floor and sat in the jumpseat behind the captain. She stated she became nauseous and ill sometime after regaining consciousness.

She stated she then noticed the captain "slumped over" in his seat with his mask over his head but not on his face. She then looked and noticed the first officer flying the airplane. He was looking straight ahead and his "shoulders were shaking as if he was nervous." She looked over and saw the flight engineer slumped over with his eyes rolled back in his head. She stated that his mask was off his face so she repositioned it to cover his face. She then repositioned the captain's oxygen mask. She stated that within a few seconds both the flight engineer and the captain recovered.

The first officer stated that the flight engineer was either "extremely hypoxic" or "unconscious" and that he was lying over the center console covering the radio panel. The first officer stated that this may have hampered his ability to communicate via the radios. He stated that by time they had descended to 23,000' the flight engineer was no longer on the panel. He did not know how he got moved but he speculated that the flight attendant moved him.

The captain reported that he was affected by hypoxia. He did not recall what happened in the cockpit between the time he reached for his oxygen mask and when he regained consciousness as the airplane was descending in the "mid-twenty" range. He recalled the airplane descending at a rate of 3,000 fpm at 280 knots somewhere between 28,000' and 24,000'. He stated his oxygen mask on his face at this time but did not recall how it got there. The captain took control of the airplane at 24,000'. The captain stated he tried to increase the rate of descent to 5,000 fpm between

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24,000' and 18,000'. The captain stated the flight engineer was alert at this time and he told him to make a PA announcement and to call the company. The flight attendant stated that at this point she went back into the cabin and sat in a jumpseat for the remainder of the flight. The captain stated that at 11,000' the flight engineer informed him that the cabin altitude had leveled off and he told the flight engineer to run the checklist. The descent and landing checklists were accomplished and the airplane was landed at Indianapolis.

The captain stated that prior to his losing consciousness he recalled seeing the cabin altitude at 22,000' and the cargo heat outflow valve open. The captain stated that he did not reach for his oxygen mask right away because he thought they could control the cabin pressure when he noticed the right pack was off. He stated he kept thinking about troubleshooting the problem and in retrospect, he should have put his oxygen on as soon as they noticed a cabin pressure problem. Neither he nor anyone else in the cockpit called for an emergency checklist during the decompression.

The flight attendants in the cabin area stated that they were beginning to prepare for a beverage service when the loss of pressurization occurred. Some stated they experienced their ears popping and others noticed a rush of cold air. They then noticed the oxygen masks falling and the all got into jumpseats with the exception of flight attendant #3 who sat in seat 31D.

The #2 flight attendant (in the front of the airplane) stated that she was the only flight attendant who could be seen by the passengers so she went through the motions of putting on the oxygen mask to demonstrate its use. They stated they heard an announcement from the cockpit stating "46, 46" followed by something to the affect of landing in a field. Three of the four flight attendants in the cabin stated the airplane was pitching up and down and rolling left and right. This resulted in two beverage carts being knocked over. One cart was blocking the 1R door and the other was blocking the 2L door. Just prior to landing, the flight attendants in the back of the airplane got out of their seats and stowed the cart near the 2L door in case they had to perform an emergency evacuation. The flight attendants stated that as far as they were able to tell, the passengers remained in their seats with their oxygen masks on during the emergency.

SURVIVAL ASPECTS

American Trans Air provided a passenger manifest to the NTSB which contained only passenger names. A list of names and addresses was requested so the passengers could be contacted to provide statements. American Trans Air was only able to provide names and addresses for 15 passengers. Witnesses statements were mailed to these 15 passengers. The NTSB received 5 completed statements in return. Several other passengers contacted the NTSB directly.

Several of the passengers reported that their first indication of a problem was ears popping, a light-headed feeling, and/or a rush of cold air. They stated that shortly thereafter the oxygen masks dropped. Several passengers described an abrupt change in the attitude of the airplane after the masks dropped. Some of the passengers recalled hearing instructions from a flight attendant regarding the use of the oxygen masks, others did not.

During subsequent interviews, several of the passengers reported having problems with either the flow of oxygen through their masks or with the masks themselves. The airplane was inspected by Federal Aviation Administration Inspectors during a stop over in Orlando, Florida. The system functioned normally. The hose lengths and mask condition of the passenger seats specifically identified as having problems were inspected as were other randomly chosen masks. The inspection failed to reveal any anomalies with the hose lengths and/or mask conditions.

FLIGHT RECORDERS

Upon notification of the incident on Monday, May 13, 1996, the NTSB requested that the cockpit

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voice recorder (CVR) and the digital flight data recorder (DFDR) be removed from the airplane and secured. Both recorders were delivered to the NTSB Recorder Laboratory, Washington, DC, for readout and evaluation.

A review of the cockpit voice recorder tape revealed no information pertinent to the incident. The captain was asked during an interview if he had considered pulling the CVR circuit breaker after landing. He stated he never thought of it. The American Trans Air 727 Operating Manual states that the Voice Recorder must be tripped following an occurrence of a flight crewmember incapacitation as a result of injury or illness.

A review of the DFDR revealed information pertinent to the incident. See attached Digital Flight Data Recorder Factual Report for details.

PHYSIOLOGICAL TRAINING


The captain stated he had not had any physiological training dealing with hypoxia during his employment with American Trans Air. He did recall having emergency descent training during his first officer and captain upgrade training.


The first officer stated that he had physiological training during ground school. He stated that the topic of hypoxia was covered in depth. In addition, he stated that 4 or 5 years ago he had been in a high altitude chamber where he experienced a depressurization at 25,000'. The first officer also stated that he had recently had simulator training on rapid decompressions.

The flight engineer stated he flies C-5s in the Air Force Reserves. He received physiological training regarding hypoxia during his initial training. He has also had emergency descent simulator training. He stated he was last in a decompression chamber approximately 2 years ago.

TESTS AND RESEARCH

The airplane was flight inspected and flight tested on the day following the incident. The flight test was conducted jointly by American Trans Air and the Federal Aviation Administration. Several different scenarios were created during the flight test. The aircraft pressurization system functioned with no anomalies. See attached Test Flight report for additional information.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: CHI96IA157			
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		Occurrence Type: Incident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used 0	Runway Length	Runway Width
Runway Surface Type:					
Runway Surface Condition:					
Type Instrument Approach:					
VFR Approach/Landing:					
Aircraft Information					
Aircraft Manufacturer Boeing		Model/Series 727-290		Serial Number 21511	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Tricycle					
Homebuilt Aircraft? No	Number of Seats: 181	Certified Max Gross Wt. 197700 LBS	Number of Engines: 3		
Engine Type: Turbo Fan	Engine Manufacturer: P&W	Model/Series: JT8D-17	Rated Power: 16000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 12/1995	Time Since Last Inspection 1261 Hours	Airframe Total Time 47305 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner GATX THIRD AIRCRAFT CORP.		Street Address FOUR EMBARCADERO STR. STE 200			
		City SAN FRANCISCO	State CA	Zip Code 94111	
Operator of Aircraft AMERICAN TRANS AIR		Street Address 7337 W. WASHINGTON ST.			
		City INDIANAPOLIS	State IN	Zip Code 46231	
Operator Does Business As: ATA			Operator Designator Code: AMTA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only					
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First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 42
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review?
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 12/1995
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	10200	3000								
Pilot In Command(PIC)										
Instructor										
Last 90 Days	152									
Last 30 Days	42									
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? No	Toxicology Performed? No	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point CHICAGO	State IL	Airport Identifier MDW	Departure Time 2000	Time Zone CDT
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Destination ST. PETERSBURG	State FL	Airport Identifier PIE	
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Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing:
Company

Method of Briefing:

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Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
	0000		0 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			0 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: None		0 Ft. AGL	Visibility: 0	SM	Altimeter: "Hg
Temperature: °C	Dew Point: 3 °C	Wind Direction: 320		Density Altitude: Ft.	
Wind Speed: 6	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0	SM	Intensity of Precipitation: Unknown		
Restrictions to Visibility: None					
Type of Precipitation: None					

Accident Information

Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None
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Classification: U.S. Registered/U.S. Soil

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer				1	1
Cabin Attendants			3	2	5
Other Crew					
Passengers			8	96	104
- TOTAL ABOARD -			11	101	112
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	11	101	112

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Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

PAMELA S. SULLIVAN

Additional Persons Participating in This Accident/Incident Investigation:

BRUCE MONTIGNEY
FAA, 8303 W. SOUTHERN AVE.
INDIANAPOLIS, IN 46241

DONALD TREICHLER
IBT, 345 CAMINO SOBRANTE
ORINDA, CA 94563

DOUGLAS M FRANKWICH
AFA, 6400 SHAFTER COURT, #740
ROSEMONT, IL 60018

STEVE COOPER
ATA, 7337 W. WASHINGTON ST.
INDIANAPOLIS, IN 46231