
Cargo door in-flight opening, Boeing 727, January 5, 1999

Micro-summary: The rear cargo door of this Boeing 727 opened on takeoff.


Event Date: 1999-01-05 at 951 MST

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

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

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		NTSB ID: LAX99IA072		Aircraft Registration Number: N804MA	
		Occurrence Date: 01/05/1999		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place PHOENIX	State AZ	Zip Code 85034	Local Time 0951	Time Zone MST	
Airport Proximity: On Airport		Distance From Landing Facility: 3		Direction From Airport: 80	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 727-225A		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>HISTORY OF FLIGHT</p> <p>On January 5, 1999, at 0951 hours mountain standard time, a Boeing 727-225A, N804MA, Miami Air flight 665, declared an in-flight emergency right after takeoff and returned to an uneventful landing on runway 26R at Sky Harbor Airport, Phoenix, Arizona. The flight was on a nonscheduled domestic passenger flight operating under the provisions of 14 CFR Part 121 and was destined for Nashville, Tennessee. The airplane sustained minor damage as a result of an open aft cargo door. The 3 flight crew, 5 flight attendants, and 170 passengers were not injured. Visual meteorological conditions prevailed at the time of the incident. The airplane was on an IFR flight plan and clearance to Nashville.</p> <p>The airplane had just departed runway 8R and was climbing through 1,000 feet when they had reports from a passenger in row 32 that he observed an open cargo door. He brought this to the attention of a rear flight attendant, who verified the observation and immediately notified the cockpit. Immediately after notifying the cockpit of the situation, the flight attendant and passenger observed the door fly all the way open. The captain stated that he looked at the flight engineer's panel and "did not see a door light." He said that a substantial bang was heard and felt throughout the airframe. A review of the Federal Aviation Administration (FAA) Phoenix Tracon north departure air-ground communications transcripts revealed that the crew declared an emergency at 0953:28, and stated their intention to return for a landing on runway 26R. After they declared an emergency, they commenced an emergency dump of fuel and landed successfully.</p> <p>The Safety Board interviewed the passenger sitting in row 32F on January 8, 1999. The passenger said that as the airplane began to power off the runway, he noticed a compartment door "pop" open. He said he notified a flight attendant in the rear jumpseat who looked at it and quickly called the cockpit about an open cargo bay door. He stated that about that time, the airplane decelerated and leveled off. He said one of the cockpit crewmembers came on the public address (PA) system and notified the passengers that they were going to declare an emergency and that they would be returning to the airport. He also said that they stated that they did not have a warning light on in the cockpit. He said he could not see the position of the door handle from where he was sitting. He said that when he first noticed the door, it was about 40 percent open. Shortly after that, he said the airflow forced it all the way open.</p> <p>The Safety Board contacted airport operations and asked if they might have security videotape monitoring of the airplane as it pushed back from the ramp area. Airport officials said they did not have any videotape from the affected area. Additionally, since the airplane was taxiing with the cargo door facing away from the ramp area, no eyewitnesses were found on any adjacent ramp areas to verify the condition of the cargo door prior to takeoff.</p> <p>Responding airport fire department units from the Aviation Fire Operations Center provided the</p>					
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Safety Board with a statement regarding their observations immediately after arriving at the airplane. They stated that about 0955, Station 19 responded to an "Alert II" involving a charter 727. The airplane declared an unknown emergency following their departure from Phoenix airport. Upon RIV-19's arrival at their predesignated staging area, they observed an inbound aircraft approaching runway 26R at a low altitude, which was trailed by jettisoned fuel. As the aircraft came to a stop on the runway they inspected the airplane's exterior and observed that the right rear cargo door was open. The fire personnel stated the latch on the cargo door was "closed or flush with the surface of the exterior skin of the door," and that one article of cargo was partially protruding from the cargo bay.

Following the shutdown of the No. 3 engine, the determination was made that it was safe for the aircraft to taxi to its designated parking area, and Station 19 equipment accompanied them to that location.

A mechanic from Dimension Aviation said he was one of the first people to respond to the Boeing 727 after it arrived back on the ramp. He said he drove a company van to the No. 3 engine area and parked it abeam the engine. He said he stood on top of a rack, which was located on top of the van. He said he noticed that the aft cargo door was in a 90-degree position to the airframe. He said he also noticed that the inner door liner and insulation blanket was hanging down. He stated that the both the door handle and the hold-open rod were in the stowed position. He said he grabbed the door handle and tried to close the door, and in the process, the handle came out to the open position. He said he was at the airplane before the FAA arrived on the scene.

An airworthiness inspector from the FAA was at airport on unrelated business when he noticed the emergency vehicles around the Miami Air Boeing 727. He said he asked an airport authority officer what had happened and was told that the aft bag pit door came open in-flight. He said he then proceeded directly to the airplane. He met the captain as he came down the aft stairs, and, after the passengers had deplaned, asked that the captain return to the cockpit with the other crewmembers. The inspector questioned each crewmember specifically about the events that took place. One of the questions he asked was whether anybody had seen the aft bag pit door light illuminated on the annunciator panel, which is located on the lower right corner of the flight engineer's panel. Their answer was "no." He asked the first officer if he noticed any engine instrument fluctuations when the loud bangs occurred and his answer was "no."

Additionally, at the FAA's insistence, maintenance personnel performed an after-incident bag count and they off-loaded a total of 208 bags.

The captain filled out a Miami Air International report of irregularity concerning the flight. In the narrative he said that the R2 flight attendant came on the interphone and said the "cargo door was open." He said he looked at the engineer's panel and did not see a door light. He said he then heard a substantial bang, and felt a shudder through the airframe and he realized they had a serious problem. He stated he declared an emergency, dumped fuel, and landed on runway 26R at Phoenix.

CREW INTERVIEWS

The captain was interviewed on January 6th, 1999, in Miami, Florida. He stated that the trip segment began on January 2nd and the airplane had been flown to Sarasota, then diverted to Columbus, Ohio. On January 3rd, the airplane was flown to Green Bay, Wisconsin, and then positioned to Phoenix. On the day of the incident, the captain said he was "running late" and mentioned an error on the dispatch release, which required certification. He signed the dispatch release about 40 minutes before the flight departed. He mentioned that the airplane was positioned on the north side of the airfield at the Ragsdale ramp and it was required to be repositioned to the south side of the airfield.

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The captain stated that the flight engineer (FE) was "hustling" due to the unexpected repositioning of the airplane. He said they repositioned the airplane and before the FE did his final walk around, he advised the FE to check the cargo nets. He said he assumed everything was OK, because when the FE returned to the cockpit, there were no cargo door lights illuminated on the annunciator panel, only the APU light was on. He stated that the scheduled departure time was 0800, with the load manifest indicating that there were 172 passengers, with 168 passengers already at the aircraft.

The captain indicated that two additional passengers finally arrived and the ground handlers had given him a bag count of 202 before the late passengers arrived. After the last passengers arrived, they pushed back from the ramp almost immediately. The captain stated he then started the No. 1 and 3 engine, followed by the No. 2 engine. He said he turned right out of the ramp and taxied to runway 8R. He stated that there were no abnormal indications during the taxi-out to the runway.

The captain stated that the APU was shut down before the takeoff checklist was performed, and that there were no abnormal indications during the takeoff roll. He said while they were climbing through 1,000 feet to level off, he heard the flight attendant's (FA) bell chime, and she advised him of the open cargo door. The captain stated he did not see any cargo door light illuminated on the annunciator panel. He said he then heard a "bang" and felt a vibration. He stated he declared an emergency, and while flying at 1,500 feet felt the airframe shudder. He said in his written statement that he sent the FE to check the door, and, after his return to the cockpit, to dump fuel in preparation for landing.

He said while he was turning the aircraft to a northerly heading, he felt "bangs" throughout the airframe, and brought the thrust lever for the No. 3 engine to flight idle, but the "bangs" continued. He said he then increased the thrust on the No. 3 engine to the normal range. He said he did not observe any indications of a compressor stall on any of the engine instruments. He said he then performed a 270-degree turn to the right and landed uneventfully on runway 26R. He said he brought the airplane to a stop on the runway and fire rescue advised them that there was an open door.

Additionally, the captain said that a Dimension maintenance individual advised him that the cargo door was "faired" and the cargo net was secure when the airplane stopped on the runway. The captain said he then taxied the airplane to the ramp and after repositioning it, noticed for the first time that there was a cargo door light illuminated in the cockpit. He said he was the first person off the airplane during the deplaning, and that he noticed that the aft cargo door stantion was hanging down and that the handle was "up." He said he also noticed that when he checked the cargo net, the left corner buckle was not secured. The captain also reported that the cargo lights were "dimmed."

The flight engineer was interviewed on January 6th, 1999, in Miami, Florida. He stated that he was an A&P mechanic and had been employed with the company since January 1998. He said as part of his duties, he entered the cockpit, started the APU, and went outside the airplane and did a complete walk-around, which included opening the forward cargo door. He stated that another individual later closed the door. He said the airplane was taxied to reposition the airplane and that he noted no discrepancies. After the airplane was repositioned, he began to compute the takeoff card, and he mentioned that he had a discrepancy with the fuel truck that had arrived to fuel the airplane. He stated that he noticed that there were five individuals outside loading the bags, and he went back inside the cockpit. He said that once he was back inside the cockpit, he did notice that the cargo door light was illuminated. The new fuel truck arrived to fuel the airplane as the passengers arrived and began boarding the airplane. The bag count given to him was 202 bags. He said he noticed that both cargo door lights were extinguished on the annunciator panel.

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He stated that he left the cockpit to do a final walk-around and went to the aft cargo door first, opened it, and held it open by the door strut. He said he noted that the cargo net was in place, secured, and all buckles were buckled. He said he closed the door without any problems and then went to the forward cargo door, where he opened and closed it. He said he then went into the cockpit area while the passengers were still boarding. He stated when he entered the cockpit, only the forward and aft entry door lights were illuminated. He said he performed the before pushback checklist and noted that when he pushed the annunciator panel lights, all door lights were out and only the APU light was illuminated.

The FE said the engines were started in the sequence of No. 1, 3, and then 2. The airplane taxied to the runway and they were number 4 for takeoff. He said he did one last scan of the annunciator panel, and that there were no abnormal indications.

After takeoff, at about 1,000 feet agl, he said he heard a "thump" and heard the FA call button chime. He said he did not hear what was said to the captain by the FA. He said the captain asked if there was any door open indications, and he replied no. He stated he left the cockpit and spoke with the FA who advised him that the aft cargo door was open. He said he reentered the cockpit and noted that no lights were illuminated in the cockpit.

The captain advised him to start dumping fuel, which was completed before they turned on the final approach back to the airport. He said the airplane landed uneventfully and stopped on the runway. While they were taxiing to return to the same location on the ramp, he noted that the cargo door light was illuminated, and it remained on until the airplane was secured.

The FE exited the airplane and said he noticed that the aft cargo door was wide open and the door strut was dangling. He said he also looked into the aft cargo compartment and noted that the aft top buckle was not secured. He said he requested a bag count from maintenance personnel and was told that they counted a total of 208 bags.

The flight attendant (FA) that was working the R-1 (cockpit and cabin bulkhead) position was interviewed on January 8, 1999, in Miami. She said that the passengers were boarding the airplane and that they had two late passengers and had to wait approximately 10 minutes for them to arrive. She could not recall anything about late baggage.

The FA who was working the L-2 (against the aft airstair) position was also interviewed on January 8, 1999, in Miami. She said there was lots of carryon baggage by the passengers. After they were airborne, she said the passenger sitting in row 32F called her over and called her attention to outside of the airplane and asked her "is that normal?" She said that she heard loud banging starting and then the captain made a public announcement that everything was okay and they were going back to land. She stated that the passenger in row 32F told her "the door was open at rotation." She further stated that she heard 5 loud compressor stalls plus about 15 muffled sounds coming from the area.

The senior FA was also interviewed on the same day. She said moments after takeoff she got on the intercom to the captain and told him that "the aft cargo bin door is open." She said the captain told her that they'd check the annunciator panel. She could not recall if the FE came back to the cabin area to verify the condition.

A review of the Miami Air Boeing 727 Aircraft Operating Manual Normal checklist was obtained and reviewed. The Before Pushback portion of the checklist requires that the crew make sure the door lights are "tested and out." During the Before Taxi section of the checklist, the crew is again prompted to ensure that the door lights are "tested and out."

GROUND HANDLING

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The ground handlers on the airplane all worked for Aviation Ground Services, (AGS), Limited. The supervisor of the company who was assisting in the baggage loading had been with the company for 5 years. He described his training as "hands-on" including watching some videos on various airplanes. He reported that Miami Air had not done any training for ramp personnel that worked for AGS. He stated that his duties were to make sure the airplane got loaded with the baggage and to make sure it was secure and ready for departure. He did not open the aft cargo door, and didn't remember seeing anybody open it. He stated that additional 5-6 bags came around, but he was sure there were 202 bags loaded. He watched one of the other AGS personnel load the baggage and perform the bag count. He said that when the Miami Air airplane was being loaded there was no "rush" going on at that time.

The supervisor mentioned that the airplane was late being repositioned to the parking area. He said that the original scheduled departure was for 0830, and that the airplane arrived to the repositioned parking area at 0800. He said that he marshaled the airplane out of the parking area by standing by the nose of the airplane where the captain could see him. The airplane moved forward as it left the parking area, it did not pushback from a gate. The supervisor said he did not notice which crewmember performed the walk-around prior to departure.

The Vice-President of Operations with AGS stated he also watched the entire loading operation of the Miami Air flight. He stated that he believed the last person to open the cargo door was "the first officer." He stated that they have "picky crews" that are always making sure that the webbing was secure. He said that once the airplane was back on the ground, he personally observed the mechanic from Dimension Aviation pull the door handle "up."

The AGS personnel who were actually involved with the bag loading were also interviewed on January 13, 1999. They stated that they were loading the bags into the pit as they came up the belt. One of the loaders stated he had a supervisor help him close the cargo door, as he had never closed a cargo door before. The AGS staff described the last person they observed to perform a walk-around as "stocky with dark hair and a mustache, approximately 5 foot 10 inches in height."

TESTS AND RESEARCH


The number 3 engine was borescoped at the request of the Safety Board. The inspection report noted that there was no damage noted to the outside of the engine case, inlet guide vane, or mounted accessories. The borescope inspection revealed no damage to the stage 1 fan and stators, 6th stage compressor section, or 13th stage compressor sections.

The Safety Board conducted a series of tests with the cargo door warning light circuit. A power cart was used to power up the airplane. The aft door warning light came on and went off in response to the proximity switch's activation. The test was repeated several times, with no discrepancies found.

At the request of the Safety Board, an FAA airworthiness inspector went over to some adjacent Boeing 727-200 series airplanes and attempted to shut the cargo door with the door handle in the closed or faired position. It is possible to close the door handle to where it is in the closed position with the door open; however, due to locking pin extension it is mechanically impossible to close the door to the faired (closed and locked) position with the door handle down. With the handle in the locked position, the closest the bottom edge of the could come to the bottom of the fuselage doorframe was measured approximately 28 inches.

FLIGHT DATA RECORDER

The Digital Flight Data Recorder (DFDR), a Sundstrand model UFDR GQUS (S/N 6299), was removed from the accident aircraft and sent to the Safety Board's Vehicle Recorder's Laboratory for readout and evaluation.

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A variety of parameters were recorded, including basic flight characteristics such as time, altitude, indicated airspeed, magnetic heading, and vertical acceleration. Engine data and aircraft orientation (pitch, roll) data were also recorded.

The DFDR data indicated that after takeoff, the aircraft climbed to an altitude of approximately 1,500 feet and remained at this altitude for approximately 100 seconds. The aircraft then continued to climb until reaching a peak altitude of 2,263 feet (approximately 200 seconds after takeoff). The aircraft then descended to land approximately 320 seconds after takeoff. A complete copy of the Specialist's Factual Report of Investigation is appended to this report.

COCKPIT VOICE RECORDER

A Fairchild model A-100A cockpit voice recorder (CVR), s/n 52420, was brought to the audio laboratory of the Safety Board on January 7, 1999. The exterior of the CVR showed no evidence of structural damage. The interior of the recorder and the tape sustained no apparent heat or impact damage. All four audio channels contained sounds that were consistent with a bulk erasure of the recording. No voices, engine noises, or any useful data were present.

COMPONENT EXAMINATION

The cargo door was examined at the Boeing Equipment Quality Assurance (EQA) Laboratory in Renton, Washington on February 9, 1999, under the supervision of the Safety Board. The contents of the crate included the cargo door, forward hinge arm, aft scissor arm with two tension rods attached, forward scissor arm with two tension rods attached, and the aft hinge arm. The examination revealed damage in the doorframe at the location of the aft hinge. According to the Boeing representative, the interior skin and three doublers had been cracked, torn, and displaced in a 3-inch by 3-inch area. The damage extended into the door beam and included several angles and gussets. Boeing also stated in their written report that the damaged surfaces also showed signs of recent fretting consistent with metal-to-metal contact during flight.

Boeing also noted that several locations showed evidence of previous minor repairs such as replaced fasteners, partially straightened metal, and repainted areas. Examination of the door stop pins showed contact marks consistent with normal door operation, but no other damage or deformation. Additionally, there were no marks or damage on the fixed or moveable doorstop fittings.

A review of the latch mechanism rigging, as specified by drawing 65-57204 sheet PL GN11 and 12, revealed no discrepancies. With the handle closed, the latch roller pin holes visually lined up with the rig pinhole in the door. This condition was not checked with an actual rig pin. Boeing representatives noted that during handle motion, the end of the NAS1104 bolt through the aft end of the 65-65754-1 rod contacted the BACB45A bumper against which the handle closes. The contact was sufficient to turn the bumper and its attach fastener as the bolt moved past the bumper. Further examination noted that the latch mechanism actuated by the handle operated smoothly in both directions. At less than approximately 40 degrees from the faired position, the handle would close when released. At more than approximately 45 degrees, the handle would move fully open when released. Between these two points, the handle would remain in position.

At the request of the Safety Board, Boeing used a push gauge to measure the force required to close the handle from the full open position. The force was applied 1 inch from the aft end of the handle. Three trials were conducted with peak force values of 15.15 pounds, 14.50 pounds, and 14.45 pounds. The peak force occurred just as the handle moved from the fully open position and decreased as the handle closed. Boeing stated that considering handle geometry, these measurements correspond to an applied moment of 20.7 feet-pounds required to close the handle (average force multiplied by moment arm).

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The forward hinge arm was visually examined and there was no damage noted to the arm. Additionally, the aft scissor arm was examined, including the tension rods, which were still attached. The tension rods were bent and showed contact marks at the inside of the bend radius and they were cracked and missing paint on the outside. Both rods were bent through approximately 35 degrees. Fretting damage was noted on the wishbone. This fretting matched the damage seen on the cargo doorframe.

The forward scissor arm was examined. The two tension rods were still attached to the scissor arm.

According to the Boeing, the tension rods were bent and showed contact marks at the inside of the bend radius, and cracked and missing paint on the outside. One rod was bent through approximately 10 degrees, and the other rod about 5 degrees. Additionally, the aft hinge arm was examined, with no damage noted.

The Safety Board asked Boeing Commercial Airplane Group to examine the possibility whether aerodynamic forces could have closed the cargo door during flight. Boeing supplied the Safety Board with some background information on the mechanics of the door operation. The aft cargo door is hinged at the top and opens outward. In a normal operating cycle, first motion is initiated by opening of the handle. As the handle is opening, two moveable stops mounted at the top of the door swing towards the door and the entire door moves upward to clear the remaining stops.

A passenger reported the door opening during the flight. If the handle had been closed during this motion, the moveable stops at the top of the door would contact the upper doorsill. No evidence of such contact was found.

The door handle is mounted on the external surface of the door, is hinged on the forward end, and opens outward. Once open, the surface of the handle is at approximately 90 degrees to the slipstream. The maximum airspeed attained during the incident flight was reported to be 190 knots.


At 190 knots and assuming a drag coefficient of 1.0, Boeing calculated the closing moment on an open handle to be 27.3 feet-pounds. During the door examination, the moment required to close the handle was found to be 20.7 feet-pounds, or 76 percent of the available aerodynamic moment. Once the handle was moved through 50 degrees, it was found that spring forces within the cargo door mechanism would move the handle to the fully closed position.

Boeing concluded that the physical evidence and their calculations of the aerodynamic forces on an open door handle would support the possibility that the door handle could have been open on the ground, and was later closed by aerodynamic forces in-flight.

The Safety Board took the aft cargo door warning proximity switch to the Equipment Quality Analysis (EQA) laboratory in Renton for further testing. Representatives of Boeing EQA staff concluded that electrical resistance testing of the switch noted high resistance between terminals 1 and 2 of the switch assembly. No other electrical anomalies were noted during testing. The cause for the high resistance was determined to be contact contamination. Boeing representatives found contact contamination across the number 1 and 2 terminals associated with the normally closed contacts of one of the two basic switches within the switch housing. Boeing concluded that they were unable to determine whether the contamination found was sufficient to have caused an indication anomaly. The complete report of the Boeing examination is appended to this report.

ADDITIONAL INFORMATION


Miami Air's Flight Operations Manual (Revision 28, dated 11/01/98) was reviewed for the flight crew's specific duties and responsibilities concerning loading of the aircraft. The flight engineer's duties are delineated on pages 1.2.10 and 1.2.11. In pertinent part, the section states that the flight engineer is responsible for supervision of the aircraft loading and ensuring "that doors are properly closed and locked."


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After the incident in Phoenix, the Vice-President of Operations of Miami Air issued Flight Operations Manual Bulletin 99-01. This document is a Safety Bulletin and requires all flight crewmembers to advise all ground handlers that in all circumstances, the flight engineer (FE), will check the cargo doors after loading is complete. Additionally, it states that if any last minute bags are added, the FE must be notified and he will then go recheck the affected door by opening and closing the door. Additionally, the bulletin states that the flight crews are to ensure that when a door is open, the affected door light is "on" the annunciator panel.

The aircraft components that were sent to Boeing Aircraft were released to the airline on August 26, 1999.

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
PHOENIX SKY HARBOR	KPHX	1133 Ft. MSL	8R	10300	150
Runway Surface Type: Asphalt					
Runway Surface Condition: Dry					
Type Instrument Approach: NONE					
VFR Approach/Landing: Precautionary Landing					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
Boeing		727-225A		22435	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 180	Certified Max Gross Wt.	191000 LBS	Number of Engines: 3	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	P&W	JT8D-15A	15500 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
AAIP	12/1998	114 Hours	42268 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
MIAMI AIR INTERNATIONAL		5000 NW 36TH STREET SUITE 307			
		City	State	Zip Code	
		MIAMI	FL	33122	
Operator of Aircraft		Street Address			
Same as Reg'd Aircraft Owner		Same as Reg'd Aircraft Owner			
		City	State	Zip Code	
Operator Does Business As: MIAMI AIR INTERNATIONAL			Operator Designator Code: MYWA		
- 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: Non-scheduled; Domestic; Passenger Only					
FACTUAL REPORT - AVIATION					

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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; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Single-engine; Instrument Airplane

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--w/ waivers/lim.	Date of Last Medical Exam: 10/1998
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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	8500	4500	1000	7500	1500	850	160			
Pilot In Command(PIC)	5000	800	900	4000	1000	750	100			
Instructor	10		10							
Last 90 Days	75	75		75		10				
Last 30 Days	40	40		40		5				
Last 24 Hours	6	6		6		2				

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

Type of Flight Plan Filed: IFR

Departure Point Same as Accident/Incident Location	State	Airport Identifier PHX	Departure Time 0950	Time Zone MST
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Destination NASHVILLE	State TN	Airport Identifier BNA	
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Type of Clearance: IFR

Type of Airspace: Class B

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
PHX	0955	MST	1133 Ft. MSL	1 NM	350 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			0 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		0 Ft. AGL		Visibility: 10 SM	Altimeter: 30.00 "Hg
Temperature: 6 °C	Dew Point: 5 °C	Wind Direction: 80		Density Altitude: Ft.	
Wind Speed: 8	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: Minor	Aircraft Fire: None	Aircraft Explosion: None

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				4	4
Other Crew					
Passengers				173	173
- TOTAL ABOARD -				180	180
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	180	180

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 National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: LAX99IA072	
	Occurrence Date: 01/05/1999	
	Occurrence Type: Incident	

Administrative Information

Investigator-In-Charge (IIC)
DEBORAH L. CHILDRESS

Additional Persons Participating in This Accident/Incident Investigation:

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