
Bounce and Hard landing, Boeing 757-232, June 2, 1999

Micro-summary: This Boeing 757-232 experienced a bounce and hard landing.


Event Date: 1999-06-02 at 2026 MST

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

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

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1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
 2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
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|--|-------------|-----------------------------------|----------------------------------|--------------------------------------|--|
|  | | NTSB ID: LAX99FA207 | | Aircraft Registration Number: N656DL | |
| | | Occurrence Date: 06/02/1999 | | Most Critical Injury: None | |
| | | Occurrence Type: Accident | | Investigated By: NTSB | |
| Location/Time | | | | | |
| Nearest City/Place PHOENIX | State AZ | Zip Code 85034 | Local Time 2026 | Time Zone MST | |
| Airport Proximity: On Airport | | Distance From Landing Facility: 0 | | Direction From Airport: | |
| Aircraft Information Summary | | | | | |
| Aircraft Manufacturer Boeing | | Model/Series 757-232 | | 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: | | | | | |
| HISTORY OF FLIGHT | | | | | |
| <p>On June 2, 1999, about 2026 hours mountain standard time, a Boeing 757-232, N656DL, was substantially damaged during a hard landing at the Phoenix Sky Harbor International Airport, Phoenix, Arizona. The airline transport certificated captain, first officer, 6 flight attendants, and 119 passengers were not injured. The flight was operated by Delta Air Lines, Inc., on an instrument flight plan under 14 CFR Part 121 as Flight 491, a scheduled domestic passenger flight. The flight originated from the John F. Kennedy Airport in New York about 1831 eastern daylight time. Visual meteorological conditions prevailed during the landing at Phoenix.</p> <p>Air traffic control cleared the airplane for a visual approach to runway 26R. The captain, who was handling the flight controls, reported that all phases of the flight up to the landing were uneventful. He described the landing as being "firm," and in the runway's touchdown zone, close to the centerline. There was a maintenance carry over (MCO) disabling the auto-spoiler deployment system, so the first officer manually deployed the spoilers upon touchdown. Thereafter, the airplane's nose pitched upward. The captain stated he then applied forward pressure to the control yoke. The captain additionally reported that he "felt a jolt" as the nose gear returned to the runway.</p> <p>The first officer also provided a statement regarding the landing events. He concurred with the captain's statements. After landing, the airplane taxied to the gate. The event was originally reported by Delta as being a hard landing incident. However, a subsequent examination of the airplane revealed substantial airframe damage.</p> | | | | | |
| PERSONNEL INFORMATION | | | | | |
| Captain. | | | | | |
| The captain had about 17,000 total flight hours. His experience flying the Boeing 757 was about 1,446 hours. He had flown this type of airplane for about 185 hours during the preceding 90 days. | | | | | |
| First Officer. | | | | | |
| The first officer had about 8,000 total flight hours. His experience flying the Boeing 757 was about 1,007 hours. He had flown this type of airplane for about 52 hours during the preceding 90 days. | | | | | |
| AIRPLANE INFORMATION | | | | | |
| The airplane was maintained by Delta on a continuous airworthiness program. Its total airframe | | | | | |

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: LAX99FA207

Occurrence Date: 06/02/1999

Occurrence Type: Accident

Narrative (Continued)

time was about 32,594 hours.

METEOROLOGICAL INFORMATION

At 1956, Phoenix reported its surface wind was from 240 degrees at 10 knots, and the visibility was 10 miles. There were few clouds at 20,000 feet.

AIRPORT AND GROUND FACILITIES

Runway 26R is 11,001 feet long by 150 feet wide.

FLIGHT RECORDERS

The airplane was equipped with a digital flight data recorder (DFDR), which was removed from the airplane and read out by the National Transportation Safety Board's Vehicle Recorders Laboratory in Washington, D.C. Data for various parameters including altitude, indicated airspeed, magnetic heading, vertical acceleration, engine power, and control surface and airplane orientation (i.e. pitch, roll) was extracted. The parameters for the positions of the control columns and spoilers was not recorded.

The DFDR data indicates that approximately 3 seconds prior to touchdown, the pitch attitude started increasing in response to nose up elevator inputs. The aircraft was descending at 650 feet per minute at approximately 125 knots. When the aircraft was 33 feet agl and at 2.6 degrees pitch, the elevators start to be increased from approximately 0 degrees. The pitch of the airplane increased as the elevators are deflected to 8.5 degrees airplane nose up. The airplane reached a maximum pitch of about 5.8 degrees, a roll right attitude of 3 degrees. The airplane initially touched down (transitioned from air to ground) at an indicated airspeed of 124 knots, and reached a maximum vertical acceleration of 1.36 g's. The next DFDR sample of the air to ground parameter showed a transition back to "air" while the pitch remained close to 5 degrees and the vertical acceleration dropped to 0.6 g's over the next 2 seconds.

The second air to ground transition occurred 3 seconds after the first transition. The indicated airspeed was 121 knots, and the vertical acceleration quickly changes from 0.6 g's to 1.64 g's in 0.5 seconds. The elevator positions changed over the next second from plus 6 degrees to minus 16 degrees and reached a maximum of -20 degrees 1 second later. In response to the elevators, the pitch attitude rapidly decreased from 3.5 degrees to -0.7 degrees at a rotation rate of 4 degrees per second. As the airplane rotated nose down, a maximum vertical acceleration of 1.77 g's is reached as the longitudinal acceleration increases from zero to -0.28 g's. (See the Flight Data Recorder Factual report for additional details.) The Delta participant reported no evidence of any mechanical malfunctions during the landing event.


WRECKAGE AND IMPACT INFORMATION


The airframe examination revealed no evidence of a tail strike. The main landing gear was undamaged. A summary of principal airframe structural damage is as follows:

1. Buckled nose gear wheel well aft bulkhead; 2. Buckled skin on both sides of the nose gear wheel well bulkhead; and 3. Damage to associated underlying structure.

ADDITIONAL INFORMATION

The Safety Board did not take custody of the airplane.

| | | | | | |
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|  National Transportation Safety Board FACTUAL REPORT AVIATION | | NTSB ID: LAX99FA207 | | | |
| | | Occurrence Date: 06/02/1999 | | | |
| | | Occurrence Type: Accident | | | |
| Landing Facility/Approach Information | | | | | |
| Airport Name | Airport ID: | Airport Elevation | Runway Used | Runway Length | Runway Width |
| PHOENIX SKY HARBOR INTL. | PHX | 1133 Ft. MSL | 26R | 11001 | 150 |
| Runway Surface Type: Asphalt | | | | | |
| Runway Surface Condition: Dry | | | | | |
| Type Instrument Approach: Visual | | | | | |
| VFR Approach/Landing: Full Stop | | | | | |
| Aircraft Information | | | | | |
| Aircraft Manufacturer | | Model/Series | | Serial Number | |
| Boeing | | 757-232 | | 24396 | |
| Airworthiness Certificate(s): Transport | | | | | |
| Landing Gear Type: Retractable - Tricycle | | | | | |
| Homebuilt Aircraft? No | Number of Seats: 178 | Certified Max Gross Wt. | 350000 LBS | Number of Engines: 2 | |
| Engine Type: | Engine Manufacturer: | Model/Series: | Rated Power: | | |
| Turbo Jet | P&W | PW2037 | 37000 LBS | | |
| - Aircraft Inspection Information | | | | | |
| Type of Last Inspection | Date of Last Inspection | Time Since Last Inspection | Airframe Total Time | | |
| Continuous Airworthiness | 05/1999 | 225 Hours | 32549 Hours | | |
| - Emergency Locator Transmitter (ELT) Information | | | | | |
| ELT Installed? | ELT Operated? | ELT Aided in Locating Accident Site? | | | |
| Owner/Operator Information | | | | | |
| Registered Aircraft Owner | | Street Address | | | |
| DELTA AIR LINES, INC. | | HARTSFIELD ATLANTA INTL AIRPT | | | |
| | | City | State | Zip Code | |
| | | ATLANTA | GA | 30320 | |
| 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: | | | Operator Designator Code: DALA | | |
| - 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 | | | | | |
| FACTUAL REPORT - AVIATION | | | | | |

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|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: LAX99FA207 |
| | Occurrence Date: 06/02/1999 |
| | Occurrence Type: Accident |

First Pilot Information

| | | | | |
|-----------------|------|------------------|---------------|-----------|
| Name On File | City | State On File | Date of Birth | Age 54 |
|-----------------|------|------------------|---------------|-----------|

| | | | |
|--------|---------------------|--------------------------------------|-----------------------------|
| Sex: M | Seat Occupied: Left | Principal Profession: Civilian Pilot | Certificate Number: On File |
|--------|---------------------|--------------------------------------|-----------------------------|

Certificate(s): Airline Transport; Flight Engineer

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? |
|---|---------------------------------|

| | | |
|------------------------|--|------------------------------------|
| Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 04/1999 |
|------------------------|--|------------------------------------|

| - 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 | 17000 | 1445 | | | | | | | | |
| Pilot In Command(PIC) | | | | | | | | | | |
| Instructor | | | | | | | | | | |
| Last 90 Days | 185 | 185 | | | | | | | | |
| Last 30 Days | | | | | | | | | | |
| Last 24 Hours | | | | | | | | | | |

| | | | |
|--------------------|----------------------------|--------------------------|-------------------|
| Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes |
|--------------------|----------------------------|--------------------------|-------------------|

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

| | | | | |
|-----------------------------|-------------|---------------------------|------------------------|------------------|
| Departure Point NEW YORK | State NY | Airport Identifier JFK | Departure Time 1831 | Time Zone EDT |
|-----------------------------|-------------|---------------------------|------------------------|------------------|

| | | | |
|---|-------|---------------------------|--|
| Destination Same as Accident/Incident Location | State | Airport Identifier PHX | |
|---|-------|---------------------------|--|


Type of Clearance: IFR; VFR

Type of Airspace: Class D

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 | 1956 | MST | 1135 Ft. MSL | 0 NM | 0 Deg. Mag. |
| Sky/Lowest Cloud Condition: Scattered | | | 20000 Ft. AGL | Condition of Light: Night/Bright | |
| Lowest Ceiling: None | | 0 Ft. AGL | Visibility: 10 | SM | Altimeter: 29.00 "Hg |
| Temperature: 29 °C | Dew Point: 4 °C | Wind Direction: 240 | | Density Altitude: Ft. | |
| Wind Speed: 10 | 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: Substantial | 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 | | | | | |
| Cabin Attendants | | | | 6 | 6 |
| Other Crew | | | | | |
| Passengers | | | | 119 | 119 |
| - TOTAL ABOARD - | | | | 127 | 127 |
| Other Ground | 0 | 0 | 0 | | 0 |
| - GRAND TOTAL - | 0 | 0 | 0 | 127 | 127 |

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: LAX99FA207

Occurrence Date: 06/02/1999

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

WAYNE R. POLLACK

Additional Persons Participating in This Accident/Incident Investigation:

JOHN D SILL
FAA PHX CMO
PHOENIX, AZ 85008

JOHN POTTHAST
DELTA AIRLINES, DEPT. 025
ATLANTA, GA 30320