
Nose gear-up landing, McDonnell Douglas DC-9-82, September 2, 2003

Micro-summary: This McDonnell Douglas DC-9-82 experienced a nose-up landing and substantial damage.


Event Date: 2003-09-02 at 1139 EDT

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

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

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		NTSB ID: NYC03FA186		Aircraft Registration Number: N454AA	
		Occurrence Date: 09/02/2003		Most Critical Injury: None	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Jamaica		State NY	Zip Code 11401	Local Time 1139	Time Zone EDT
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer McDonnell Douglas		Model/Series DC-9-82		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 September 2, 2003, about 1139 eastern daylight time, a McDonnell Douglas DC-9-82 (MD-82), N454AA, operated by American Airlines as flight 1048, was substantially damaged during an emergency landing at the John F. Kennedy International Airport (JFK), Jamaica, New York, after the flightcrew was unable to extend the nose landing gear. The 2 flightcrew members, 3 flight attendants, and 133 passengers were not injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan had been filed for the flight that departed the Dallas/Fort Worth International Airport (DFW), Dallas, Texas, and was destined for the Newark Liberty International Airport (EWR), Newark, New Jersey. The scheduled passenger flight was conducted under 14 CFR Part 121.</p> <p>The first officer was designated as the flying pilot for the flight. While on final approach to EWR, the landing gear was lowered; however, the nose gear indicator red light remained illuminated and the nose landing gear indicator pin did not extend. The first officer executed a missed approach, and flew air traffic control vectors, while the captain attempted to troubleshoot the problem. After performing emergency checklists, which included the emergency gear extension checklist, the captain diverted to JFK, and performed a low approach over runway 4L, a 11,351-foot-long, 150-foot-wide, asphalt runway. Ground personnel who observed the airplane stated that the nose gear doors were partially open, however, the nose gear was not visible. The captain subsequently performed an emergency landing to runway 4L, with the nose landing gear retracted. After the airplane came to a stop, the passengers deplaned via the aft door exit.</p> <p>The accident occurred during the hours of daylight approximately 40 degrees, 38 minutes north latitude, and 73 degrees, 46 minutes west longitude.</p>					
PERSONNEL INFORMATION					
<p>The captain held an airline transport pilot certificate for multiengine-land airplanes. He also held a flight engineer certificate. The captain was also type rated in Boeing 757, 767, Cessna CE-500, and McDonnell Douglas DC-9 series airplanes. American Airlines reported that the captain had accumulated about 13,000 hours of total flight experience, which included 7,680 hours in DC-9 series airplanes.</p> <p>The captain's most recent Federal Aviation Administration (FAA) first class medical certificate was issued on August 19, 2003.</p> <p>The first officer held a commercial pilot certificate for multiengine-land airplanes. He also held a flight engineer certificate. American Airlines reported that the first officer had accumulated 10,200 hours of total flight experience, which included 7,600 hours in DC-9 series airplanes.</p>					
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The first officer's most recent FAA first class medical certificate was issued on July 21, 2003.

AIRCRAFT INFORMATION

The airplane was maintained under a continuous airworthiness inspection program. The airplane had been operated for about 5 hours, since it's most recent inspection, which was performed on August 31, 2003.

Review of the airplane's on board maintenance logbook did not reveal any prior discrepancies regarding the landing gear extension retraction system.

METEOROLOGICAL INFORMATION

The reported weather at JFK, at 1144, was: winds from 50 degrees at 12 knots; visibility 10 statute miles; few clouds at 900 feet, ceiling broken at 1,600 feet, and overcast at 2,600 feet; temperature 62 degrees F, dew point 16 degrees F; altimeter 30.13 in/hg.

FLIGHT RECORDERS

The airplane was equipped with a Fairchild model FA-2100-1020 solid-state 2 hour cockpit voice recorder (CVR), and a Fairchild model FA2100 solid-state flight data recorder (FDR).

Both recorders were forwarded to the Safety Board's Office of Research and Engineering for examination.

The CVR captured the accident, approximately 49 minutes into the 2 hour recording. The cockpit crew were heard troubleshooting the problem and performing the appropriate checklist items in consultation with company procedures. The recording ended immediately after the airplane came to a stop on the runway.

The FDR was downloaded, and plots were generated for the last 2.6 minutes of the flight. (The plots and tabular data can be found in the public docket)

WRECKAGE INFORMATION

The airplane touched down about 1/3 of way down the runway. Examination of the runway revealed the airplane's nose contacted the ground about 1 foot to the left of the runway centerline. The nose slid approximately 745 feet, and came to rest 30 feet to the left of the runway centerline.

Airbags were utilized to raise the nose of the airplane, and the airplane was subsequently towed to a hangar for further examination.

Examination of the airplane revealed the forward fuselage belly section exhibited severe scrape damage from station 68 to 168. The forward and aft nose landing gear doors also sustained scraping damage. A 6-inch and 9-inch tear was observed in the pressure bulkhead located at station 110. The nose landing gear remained in the wheel well. The polyurethane nose landing gear spray deflector was fractured near the middle, and found in two sections. The right section of the spray deflector had rotated about 180 degrees, and was found wedged between the nose landing gear and the right side of the wheel-well structure. The nose landing gear tire was above the wedged spray deflector section. The left section of the spray deflector was found in it's original position, which was forward, with the nose landing gear retracted.

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There was evidence of yellow paint transfer on the right upper surface (aft corner) of the spray deflector. Similar paint marks were observed on the left bottom surface (forward corner) of the spray deflector section. In addition, yellow paint chips were found embedded under a screw head at that location. The distance between the two yellow paint marks was approximately 29 inches. In addition, the right debris deflector, which extended from the side of the spray deflector exhibited evidence of scrape and measured 3-3/32 inches. The left debris deflector exhibited no damage and measured 3-10/32 inches.

After removing the wedged spray deflector section, the nose landing gear was extended manually. The airplane was then connected to a ground power unit and a satisfactory functional check of the nose landing gear was performed. In addition, the manual gear extension system performed normally.

Ground personnel who participated in the pushback of the airplane from the gate, prior to departure from DFW, reported that the tow bar became disconnected while the airplane was being towed. According to the tow operator:

"...I put the push out tractor in reverse and started towing the airplane backwards. I was looking behind the push out tractor as I was towing the plane. I felt the tractor slip. I wasn't sure what happened, when I turned around and looked at the airplane, I saw the bar had come loose. I informed the captain of the bar breaking loose and told him to park his brakes. I then told my wing walker to get another tow bar. I told the captain we were getting another tow bar and the captain said if everything was OK, he would leave from the spot that they were at. I told [the captain] it looked OK to me...."

The airplane subsequently taxied for takeoff, and departed without incident.

Examination of tow bars used on the MD-82 at JFK, revealed that the distance between the forks measured approximately 30 inches. The tow bars examined at JFK were painted red; however, according to American Airlines, the tow bar used to tow the airplane at DFW was painted yellow.

TESTS AND RESEARCH

According to McDonnell Douglas, in addition to the accident flight, there were two other occasions where a failed spray deflector from the MD-80/MD-90/717 fleet, was able to pass the side wheel bay structural stops on retraction, wedge above the stops, and prevent gear extension.

A nose gear swing test confirmed that a broken polyurethane spray deflector assembly, when rotated aft by the air stream during gear retraction, could deflect enough to allow the assembly to wedge past the structural stops and subsequently prevent gear extension. At the time of this report, McDonnell Douglas was testing a design change which would alter the structural stops to better assure that a broken spray deflector could not enter the wheel well.

ADDITIONAL INFORMATION

Wreckage Release

The airplane was released to American Airlines on September 4, 2004.

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
John F. Kennedy International	JFK	13 Ft. MSL	4L	11351	150
Runway Surface Type: Asphalt; Concrete					
Runway Surface Condition: Dry					
Type Instrument Approach: Visual					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
McDonnell Douglas		DC-9-82		49559	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 136	Certified Max Gross Wt.	147 LBS	Number of Engines: 2	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Jet	Pratt & Whitney	JT8D-217C	20000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	08/2003	5 Hours	46603 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
		555 California St.			
Bay 2 Bay Leasing LLC		City	State	Zip Code	
		San Francisco	CA	94104	
Operator of Aircraft		Street Address			
		City	State	Zip Code	
AMERICAN AIRLINES INC		Fort Worth	TX	76155	
Operator Does Business As:			Operator Designator Code: AALA		
- 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/Cargo					
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First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 53
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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; 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? 01/2003
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 08/2003
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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	13004	7680	15	12989	6000					
Pilot In Command(PIC)	8349	7680	2	669	240					
Instructor	116				116					
Last 90 Days	225	225		225	110					
Last 30 Days	75	75		75	43					
Last 24 Hours	3	3		3	1					

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 Dallas-Fort Wor	State TX	Airport Identifier DFW	Departure Time 0534	Time Zone EDT
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Destination Newark	State NJ	Airport Identifier EWR	
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Type of Clearance: IFR

Type of Airspace: Class B

Weather Information

Source of Briefing: Company

Method of Briefing: In Person; Teletype

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Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
JFK	1144	EDT	13 Ft. MSL	0 NM	Deg. Mag.

Sky/Lowest Cloud Condition: Few 900 Ft. AGL Condition of Light: Day

Lowest Ceiling: Broken Ft. AGL Visibility: 10 SM Altimeter: 30.13 "Hg

Temperature: 17 °C Dew Point: 16 °C Wind Direction: 50 Density Altitude: Ft.

Wind Speed: 12 Gusts: Weather Conditions at Accident Site: Visual Conditions

Visibility (RVR): Ft. Visibility (RVV) SM Intensity of Precipitation:

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				3	3
Other Crew					
Passengers				133	133
- TOTAL ABOARD -				138	138
Other Ground					
- GRAND TOTAL -				138	138

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Administrative Information

Investigator-In-Charge (IIC)

Luke Schiada

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