
Contained engine failure, McDonnell Douglas MD-82, April 28, 1997

Micro-summary: A contained engine failure on this McDonnell Douglas MD-82 resulted in a diversion.


Event Date: 1997-04-28 at 1222 MST

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

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

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		NTSB ID: LAX971A170		Aircraft Registration Number: N470AA	
		Occurrence Date: 04/28/1997		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place TUCSON	State AZ	Zip Code 85706	Local Time 1222	Time Zone MST	
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-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 April 28, 1997, at 1222 hours mountain standard time, a McDonnell Douglas MD-82, N470AA, sustained a left engine turbine section contained failure and tail pipe fire during the takeoff initial climb from Tucson, Arizona. The aircraft returned to Tucson for a successful landing and stopped on the runway where a partial evacuation was accomplished. The aircraft was operated by American Airlines as Flight 230, a regularly scheduled domestic passenger flight from Tucson to Dallas-Fort Worth, Texas, under 14 CFR Part 121. Visual meteorological conditions prevailed and an IFR flight plan was filed. There were no injuries to the 118 passengers, 3 cabin attendants, and 2 flight crew. The aircraft sustained minor damage, which was confined to the engine and associated nacelle. While several houses under the aircraft's flight track sustained minor damage from falling hot engine parts, there were no ground injuries.</p>					
<p>Ground witnesses on the airport observed a puff of smoke emanate from the aircraft just after rotation. One passenger stated that he heard what he described as a "compressor stall" after liftoff. According to a preliminary statement from the captain, the aircraft was climbing through 1,800 feet agl when a loud bang was heard followed by the left engine spooling down. The engine was secured and one fire extinguisher bottle was fired. The crew returned for an uneventful landing on runway 29R and stopped.</p>					
CRASH FIRE AND RESCUE RESPONSE					
<p>Airport Crash Fire Rescue vehicles followed the aircraft and extinguished a tail pipe fire in the left engine after the aircraft came to a stop. As the airport fire department was extinguishing the tail pipe fire, about 16 passengers exited the forward left door via the slide (the only one deployed), and passengers were also climbing onto the wing from the over wing exit hatches on both sides of the aircraft. The CFR personnel stopped the evacuation on the forward slide, prevented the passengers on the wing from jumping to the ground, and talked them into moving back inside the aircraft. The remainder of the passengers and crew were deplaned using portable stairs.</p>					
<p>An examination of the ATC Transcript, which recorded the conversation between Tucson Air Traffic Control Tower and American Airlines Flight 230, revealed that the flight crew had requested additional information from the control tower about the condition of the left engine. The control tower verified that they observed flames out of the left engine. The flight deck crew gave the evacuation command and instructed the flight attendants to "use the right side exits only." A short time later, Flight 230 asked the tower "how do I correspond with the folks in the trucks and make sure what's going on with the left engine . . ." The controller replied, "you go to one two four point four that's the ground control frequency and airport forty six is in charge of the fire rescue." Review of the transcripts revealed that the crew experienced difficulty in establishing radio contact with the airport CFR vehicles.</p>					
FACTUAL REPORT - AVIATION					

National Transportation Safety Board

FACTUAL REPORT

AVIATION

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Narrative (Continued)

The number one flight attendant was riding in the forward entry door flight attendant jump seat. In her written statement and during her interview, she said that she heard the evacuation command, but she could barely hear the Captain on the P.A. and did not hear the right side only portion. She stated that she assessed the condition of the left forward entry door and that she saw no fire or smoke. Additionally, she said she saw fire trucks and firemen right outside the door. She said that one fireman "gave me the thumbs up, then I proceeded to open the door" and initiate an evacuation on the left side of the aircraft.

One of the first fireman to arrive was from one of the Arizona National Guard units and was interviewed. He stated that the flight attendant had already initiated the evacuation process when he arrived on the scene. He said he gave the "thumbs up" hand signal to stop the evacuation and also attempted to verbally communicate with the flight attendant in order to stop the evacuation. After some difficulty, he succeeded in getting her to stop the evacuation.

PERSONNEL INFORMATION


The number one flight attendant was hired by American Airlines on December 13, 1990, after receiving her initial training on the MD-82 on December 12, 1990 (American Airlines does not formally offer a prospective flight attendant a job until they have successfully completed the initial flight attendant indoctrination). Her most recent recurrent training in this aircraft type was conducted on November 21, 1996.


ENGINE TEARDOWN

The engine, a Pratt & Whitney JT-8D, serial number 709843, had undergone a B-check on March 17, 1997. The postincident engine teardown was performed at the American Airlines Tulsa facility on May 30, 1997, under the supervision of the DFW Certificate Management Office of the FAA. The examination revealed that there was considerable damage and failure to stages 1-4 turbine blades. The examining engineers stated that "the 1st stage NGV was found with the outer buttress aft flow guide (angel wing) completely missing." According to the report, a determination of the fracture mode was not possible. A complete summary report of the teardown report is appended.

ADDITIONAL INFORMATION

Discussions with American's safety department disclosed that the company has been concerned in general for some time about the inability of flight crew's during an emergency to contact CFR units directly. Currently, American is contacting airports they serve and associated CFR units in an attempt to implement a known discrete frequency for their flight crews to communicate with emergency response units. The current chairman of the Air Transport Association (ATA) Flight Incidence Review and Analysis committee stated that "it is the consensus of the ATA members that the dedicated frequency [for flight crews to talk to responding CFR units] is an appropriate tool."

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
TUCSON INTERNATIONAL	KTUS	2641 Ft. MSL	29	10994	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	
McDonnell Douglas		MD-82		49600	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 148	Certified Max Gross Wt.	149500 LBS	Number of Engines: 2	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	P&W	JT8D-217	20000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	03/1997	370 Hours	25599 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			
AMERICAN AIRLINES		4333 AMON CARTER BLVD			
		City	State	Zip Code	
		FORT WORTH	TX	76155	
Operator of Aircraft		Street Address			
Same as Reg'd Aircraft Owner		P.O. BOX 619616			
		City	State	Zip Code	
		DFW AIRPORT	TX	75261	
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 Only					
FACTUAL REPORT - AVIATION					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: LAX97IA170
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	Occurrence Type: Incident

First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 49
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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: 03/1997
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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	13000	4495								
Pilot In Command(PIC)										
Instructor										
Last 90 Days	252									
Last 30 Days	72									
Last 24 Hours	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 TUS	Departure Time 1220	Time Zone MST
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Destination DALLAS	State TX	Airport Identifier DFW	
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Type of Clearance: IFR

Type of Airspace: Class C

Weather Information

Source of Briefing:
Company; National Weather Service

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
TUS	1056	MST	2641 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			0 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		0 Ft. AGL	Visibility: 10 SM	Altimeter: 29.00 "Hg	
Temperature: 29 °C	Dew Point: 3 °C	Wind Direction: 300		Density Altitude: Ft.	
Wind Speed: 10	Gusts: 15	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: In-flight	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				118	118
- TOTAL ABOARD -				123	123
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	123	123

National Transportation Safety Board

FACTUAL REPORT

AVIATION



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Occurrence Date: 04/28/1997

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

DEBBIE L. CHILDRESS

Additional Persons Participating in This Accident/Incident Investigation:

LONNIE GILES
WP-PHX-CMO
PHOENIX, AZ 85008