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## In-flight loss of both engines, McDonnell Douglas MD-82, June 4, 2002

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**Micro-summary:** This McDonnell Douglas MD-82 lost engine power from both engines when in cruise, leading to an aerodynamic stall.

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**Event Date:** 2002-06-04 at 1238 CDT


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

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

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		NTSB ID: CHI02IA151		Aircraft Registration Number: N823NK	
		Occurrence Date: 06/04/2002		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Wichita	State KS	Zip Code 67209	Local Time 1238	Time Zone CDT	
Airport Proximity: Off Airport/Airstrip		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 June 4, 2002, at 1238 central daylight time, a McDonnell Douglas MD-82, N823NK, operated as Spirit Airlines Flight 970, experienced a loss of power from both engines while in cruise flight at flight level (FL) 330. The power loss occurred about 20 nautical miles west of Wichita, Kansas. Power from both engines was restored and the airplane diverted to the Wichita Mid-Continent Airport, Wichita, Kansas, without further incident. The 14 CFR Part 121 scheduled passenger flight was operating on an instrument flight rules flight plan. No injuries to the 105 passengers or 6 crewmembers were reported. The flight originated from the Denver International Airport, Denver, Colorado at 1140 and was en route to the Ft. Lauderdale/Hollywood International Airport, Ft. Lauderdale, Florida.</p>					
<p>In a telephone interview, the captain stated that the flight was uneventful until he and the first officer simultaneously noticed the low-pressure compressor speed (N1) and EPR indications were low on both engines. He said that they also noticed that the airspeed was deteriorating very rapidly. He stated that he took control of the airplane, disconnected the autopilot, and started an immediate descent. He said that the stick shaker activated briefly. The captain went on to describe the restart of the engines and subsequent descent and landing. He stated that a right engine restart was accomplished about 17,000 feet altitude, and the left engine started on its own a short time later. The captain stated that everything was normal prior to the incident and after the engines were restarted. He said that the autopilot was engaged and the autothrottles were on when the event happened. He stated that he did not recall seeing the throttle levers moving and if they did move, they did they moved very slowly. He said that ice protection was not used and the temperature never got close to plus 6 degrees. The complete summary of the interview is included in the public docket associated with this accident.</p>					
<p>In a telephone interview, the first officer stated that one hour into the flight he felt a vibration that came on fast and got worse in a matter of seconds. He said that the captain took control of the airplane and disengaged the autopilot. He said that the stall horn sounded and the stick shaker activated and the captain pushed the nose of the airplane down. He said that both engines were rolled back. When asked about the vibration, the first officer stated that he was not sure if it was a stall, or a pre-stall buffet. He stated that engine anti-ice was off. The first officer reported that the airplane broke out on top of the clouds at 17,000 feet and was in the clear after that. He stated that there were a just a few scattered cirrus clouds. He stated that at the time the stall warning activated, both engines rolled back simultaneously while the throttles stayed in position at the normal cruise setting. He said that the captain pushed the throttles forward but there was no response from the engines. The complete summary of the interview is included in the public docket associated with this incident report.</p>					
PERSONNEL INFORMATION					

National Transportation Safety Board

## FACTUAL REPORT

AVIATION

NTSB ID: CHI02IA151

Occurrence Date: 06/04/2002

Occurrence Type: Incident

## Narrative (Continued)

The captain held an airline transport pilot certificate with single and multi-engine airplane ratings. He was type rated in the DC-9. His most recent first class medical certificate was issued on December 20, 2001, and listed the limitation that he wear corrective lenses. The captain reported that he had been employed by the airline since February 1998, and that he had been a captain since February 2000. The report submitted by the airline listed his total flight experience as 7,200 hours. The report listed 1,720 total hours and 1,400 hours as pilot in command in the same make and model as the incident airplane. The pilot reported that he had received training at the Air Line Pilots Association (ALPA) safety schools, including accident investigation. He reported that at the time of the incident, he was the ALPA alternate for the Aviation Safety Actions Program (ASAP) review committee, and the local Air Safety Chairman for Spirit Airline's Fort Lauderdale, Florida base.

The first officer held an airline transport pilot certificate with single and multi-engine airplane ratings. His most recent first class medical certificate was issued on March 11, 2002. The report submitted by the airline listed his total flight experience as 8,900 hours with 376 hours in the same make and model as the incident airplane. The first officer had no logged pilot in command time in the incident aircraft make and model.

## AIRCRAFT INFORMATION

The airplane was a McDonnell Douglas DC-9-82, serial number 48020. The airplane has a maximum gross weight of 149,500 pounds. Two Pratt and Whitney JT8D-219 turbofan engines powered the airplane. Each engine has a normal takeoff thrust rating of 21,000 pounds and a maximum takeoff thrust rating of 21,700 pounds. The left engine serial number was 696364, and the right engine serial number was 696426.

## METEOROLOGICAL INFORMATION

A Meteorological Factual Report was prepared in conjunction with the incident investigation. Weather radar data indicates that about 7 minutes prior to the incident, the cloud tops were 30,000 feet at the incident location and 35,000 feet about 10 nautical miles west. The weather radar echo intensity at 33,000 feet altitude was 16 dBZ at the incident location about 8 minutes prior to the incident. The upper air data for Topeka, Kansas, about 99 nautical miles northeast of the incident, shows temperatures of -38.1 and -47.4 degrees Celsius at 31,339.0 and 35,006.6 feet altitude respectively at 0700. The temperatures were -36.5 and -45.7 degrees Celsius at 31,338.4 and 35,006.6 feet altitude respectively at 1900. The complete Meteorological Factual Report is included in the public docket associated with this report.

## FLIGHT RECORDERS

The digital flight data recorder (DFDR) was removed from the airplane and the data read out at the National Transportation Safety Board's recorder laboratory in Washington, D.C. The data is recorded with reference to the DFDR subframe reference number (SRN), where each SRN equals 1 second of elapsed time. Examination of the data revealed that the incident flight originated about 1,800 SRN and landed about 5,892 SRN. The DFDR data indicates that the dual engine roll back event began about 48 minutes and 45 seconds into the flight at 4,725 SRN. Graphs of various recorded parameters were plotted. The complete DFDR report, including the parameter plots, is included in the public docket associated with this report.

The cockpit voice recorder (CVR) circuit breaker had not been pulled after the incident. As a consequence, the recording contained on the CVR did not cover the time of the incident and the CVR was not read out.

## TESTS AND RESEARCH

National Transportation Safety Board

## FACTUAL REPORT

AVIATION

NTSB ID: CHI02IA151

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Occurrence Type: Incident

## Narrative (Continued)

The NTSB conducted an on-scene examination of the airplane and engines on June 5, 2002. A Powerplants Group was formed, and the complete Powerplants Group Factual Report is included in the public docket associated with this report. Among the items examined were the engines, fuel tank boost pumps, fuel heater and anti-ice valves. Examination of the right engine revealed several nicks dents and tears to the 7th stage compressor blades. No other damage or anomalies were found that could be associated with the incident. A power assurance check of the left engine showed that it could attain take off power without exceeding any performance limits. A power assurance check of the right engine was not performed due to the damage noted to the 7th stage compressor blades. Fuel samples were taken from each of the airplane's fuel tanks, engines, and the fuel truck that serviced the airplane at the departure airport. All of the fuel samples were found to conform to the applicable specification.


Examination of the DFDR data revealed that the roll back of both engines occurred about SRN 4,725.


The only engine performance parameter recorded is EPR. The DFDR data shows that the airplane was in level flight at FL330. At SRN 4,183, about 9 minutes and 2 seconds prior to the roll back, the left engine EPR indication was 1.74, the right engine EPR indication was 1.69, the airplane's airspeed was 269.25 knots, and the pitch attitude was 1.79 degrees. By SRN 4,199, 8 minutes and 46 seconds prior to the roll back, the left engine EPR had increased to 2.00, the right engine EPR had increased to 1.95, the airspeed had dropped to 260.5 knots, and the pitch attitude had increased to 2.24 degrees. By SRN 4,285, 7 minutes and 20 seconds prior to the roll back, the left engine EPR had decreased to 1.77, the right engine EPR had decreased to 1.72, the airspeed had increased to 273.5 knots, and the pitch attitude had decreased to 1.79 degrees. This occurred while the airplane remained at FL 330. DFDR data shows that the autothrottles reached the EPR limit during this period.

At SRN 4,416, about 5 minutes and 9 seconds prior to the roll back, the left engine EPR indication was 1.69, the right engine EPR indication was 1.63, the airplane's airspeed was 271.75 knots, and the pitch attitude was 0.9 degrees. By SRN 4,482, 4 minutes and 3 seconds prior to the roll back, the left engine EPR had increased to 2.03, the right engine EPR had increased to 1.91, the airspeed had dropped to 260.25 knots, and the pitch attitude had increased to 1.34 degrees. Over the next 4 minutes and 3 seconds, until SRN 4,725, the EPR indications fluctuated between 2.08 and 1.96 on the left engine, and 2.04 and 1.91 on the right engine. During this same period, the airplane remained at FL 330, the airspeed dropped to 209.25 knots, and the pitch increased to 4.91 degrees. Between SRN 4,725 and 4,735, the EPR indications for the left and right engines dropped to 1.05 and .86 respectively. By SRN 4,749, 24 seconds after the roll back, the airspeed had dropped to 187 knots and the pitch had increased to 8.44 degrees. DFDR data shows that the autothrottles reached the EPR limit during this period. The DFDR plots are included in the public docket material associated with this report.

## ADDITIONAL INFORMATION

Spirit Airlines, Pratt and Whitney, Boeing, The Air Line Pilots Association, and the Federal Aviation Administration were parties to the investigation.

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: CHI02IA151				
		Occurrence Date: 06/04/2002				
		Occurrence Type: Incident				
<b>Landing Facility/Approach Information</b>						
Airport Name		Airport ID:	Airport Elevation Ft. MSL	Runway Used	Runway Length	Runway Width
Runway Surface Type:						
Runway Surface Condition:						
Type Instrument Approach:						
VFR Approach/Landing:						
<b>Aircraft Information</b>						
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-82		Serial Number 48020		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Retractable - Tricycle						
Homebuilt Aircraft? No		Number of Seats: 166	Certified Max Gross Wt. 149500 LBS		Number of Engines: 2	
Engine Type: Turbo Fan		Engine Manufacturer: Pratt & Whitney		Model/Series: JT8D-219	Rated Power: 21700 LBS	
- Aircraft Inspection Information						
Type of Last Inspection Continuous Airworthiness		Date of Last Inspection	Time Since Last Inspection Hours		Airframe Total Time 53116 Hours	
- Emergency Locator Transmitter (ELT) Information						
ELT Installed? No		ELT Operated? No		ELT Aided in Locating Accident Site? No		
<b>Owner/Operator Information</b>						
Registered Aircraft Owner SPIRIT AIRLINES INC.		Street Address 2800 Executive Way				
		City Miramar		State FL	Zip Code 33025	
Operator of Aircraft Same as Reg'd Aircraft Owner		Street Address Same as Reg'd Aircraft Owner				
		City		State	Zip Code	
Operator Does Business As:				Operator Designator Code: GTIA		
- 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						

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: CHI02IA151
	Occurrence Date: 06/04/2002
	Occurrence Type: Incident

**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

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

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s):

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review? 02/2002
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 12/2001
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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	7200	1720								
Pilot In Command(PIC)	5400	1400								
Instructor										
Last 90 Days		165								
Last 30 Days		46								
Last 24 Hours		4								

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 DENVER	State CO	Airport Identifier DEN	Departure Time 1140	Time Zone CDT
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Destination FORT LAUDERDALE	State FL	Airport Identifier FLL	
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Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing: Company

Method of Briefing: Unknown

 <p>National Transportation Safety Board <b>FACTUAL REPORT</b> AVIATION</p>	NTSB ID: CHI02IA151
	Occurrence Date: 06/04/2002
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**Weather Information**


WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
ICT	1248	CDT	1333 Ft. MSL	10 NM	197 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			4000 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: Overcast			18000 Ft. AGL	Visibility: 10 SM	Altimeter: 29.88 "Hg
Temperature: 23 °C	Dew Point: 17 °C	Wind Direction: 60		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: 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					
Cabin Attendants				4	4
Other Crew					
Passengers				105	105
- TOTAL ABOARD -				111	111
Other Ground					
- GRAND TOTAL -				111	111

 <p>National Transportation Safety Board <b>FACTUAL REPORT</b> AVIATION</p>	NTSB ID: CHI02IA151
	Occurrence Date: 06/04/2002
	Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)  
John M. Brannen

Additional Persons Participating in This Accident/Incident Investigation:

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