



National Transportation Safety Board Aviation Accident Final Report

Location:	DENVER, CO	Accident Number:	DEN00FA078
Date & Time:	04/27/2000, 2130 MDT	Registration:	N990CF
Aircraft:	Douglas DC-8-62F	Aircraft Damage:	Substantial
Defining Event:		Injuries:	5 None
Flight Conducted Under:	Part 121: Air Carrier - Non-scheduled		

Analysis

The airplane was in cruise flight at 37,000 feet msl. The captain said that they heard a loud bang and the airplane shook, and they immediately began to lose cabin pressurization. The engine instruments went dead on number two engine, and they pulled the number two emergency 'T' handle. He said that they donned their oxygen masks, began descending, and diverted to Denver. Postlanding examination of the number two-engine nacelle revealed that the inboard and outboard main engine cowlings had separated from the aircraft. An 18x6 inch hole was found half way up the fuselage (pressure bulkhead), just aft of the left wing; the left horizontal stabilator was also damaged. Further examination of the engine revealed that the 4 inch-diameter high-pressure bleed air duct had separated from the high-pressure relief valve, and the clamp that connected them was missing. The clamp was never located. According to the operator, failure of the clamp would dump high-pressure bleed air into the nacelle, resulting in over-pressurization and separation of the cowlings. The wire bundle, which transmitted the number two-engine monitoring data to the cockpit was found cut. There was no evidence of engine fire or fire in the nacelle cavity.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the clamp that secured the high-pressure bleed air duct to the high-pressure relief valve. Factors were the resulting excessive pressurization of the engine nacelle, and the subsequent separation of the engine cowling.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings

1. (C) MISCELLANEOUS, BOLT/NUT/FASTENER/CLAMP/SPRING - FAILURE
2. (F) BLEED AIR SYSTEM, LINES - DISCONNECTED
3. (F) NACELLE/PYLON - PRESSURE EXCESSIVE
4. (F) COOLING SYSTEM, COWLING - SEPARATION
5. FUSELAGE, PRESSURE BULKHEAD - PENETRATED

Factual Information

On April 27, 2000, at 2130 mountain daylight time, a Douglas DC-8-62F, N990CF, was substantially damaged when the number two engine cowling departed the airplane near Denver, Colorado. The airline transport captain and first officer, the commercial pilot flight engineer, and two passengers were not injured. The airplane was owned by Fleet National Bank of Hartford, Connecticut, and was being operated by Emery Worldwide Airlines, Vandalia, Ohio, under Title 14 CFR Part 121. Visual meteorological conditions prevailed for the night cross-country flight, which originated from Seattle, Washington, 2 hours 48 minutes before the accident. An IFR flight plan had been filed for the cargo flight that was en route to Dayton, Ohio.

The captain said that they were in cruise flight at 37,000 feet mean sea level (msl). He said that they heard a loud bang and the airplane shook, and they immediately began to lose cabin pressurization. The engine instruments went dead on number two- engine, and they pulled the number two emergency "T" handle. He said that they donned their oxygen masks, began descending, and diverted to Denver. Their landing was uneventful.

Postlanding examination, by the NTSB Investigator-In-Charge and an FAA Inspector, of the number two-engine nacelle revealed that the inboard and outboard main engine cowlings had separated from the aircraft. An 18x6 inch hole was found half way up the fuselage (pressure bulkhead), just aft of the left wing; the left horizontal stabilator was also damaged. Further examination of the engine revealed that the 4 inch-diameter high pressure bleed air duct had separated from the high-pressure relief valve, and the connecting clamp was missing. The clamp was never located.

The wire bundle, which transmitted the number two engine monitoring data to the cockpit, was found cut. There was no evidence of engine fire, or fire in the nacelle cavity.

According to the operator: "when the clamp assembly failed, high pressure bleed air from the 4 inch diameter duct dumped into the area inside of the engine cowlings. The sudden over-pressurization probably expanded the main engine cowlings into the air stream, leading to the loss of the cowlings. The amount of airflow from the high pressurization bleed air duct far exceeds the air discharge capacities of the cowling blowout panels."

Pilot Information

Certificate:	Airline Transport; Commercial; Flight Engineer	Age:	52, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last Medical Exam:	03/17/1999
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	11000 hours (Total, all aircraft), 5100 hours (Total, this make and model), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Douglas	Registration:	N990CF
Model/Series:	DC-8-62F DC-8-62F	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	46068
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	04/13/2000, Continuous Airworthiness	Certified Max Gross Wt.:	350000 lbs
Time Since Last Inspection:	74 Hours	Engines:	4 Turbo Fan
Airframe Total Time:	51844 Hours	Engine Manufacturer:	P&W
ELT:	Not installed	Engine Model/Series:	JT3D-7
Registered Owner:	FLEET NATIONAL BANK	Rated Power:	19000 lbs
Operator:	EMERY WORLDWIDE AIRLINES	Air Carrier Operating Certificate:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	RRXA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	MLS, 2628 ft msl	Observation Time:	2056 MDT
Distance from Accident Site:	0 Nautical Miles	Direction from Accident Site:	0°
Lowest Cloud Condition:	Thin Broken / 8000 ft agl	Temperature/Dew Point:	15° C / 0° C
Lowest Ceiling:	None / 0 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	8 knots, 110°	Visibility (RVR):	0 ft
Altimeter Setting:	30 inches Hg	Visibility (RVV):	0 Miles
Precipitation and Obscuration:			
Departure Point:	SEATTLE, WA (SEA)	Type of Flight Plan Filed:	IFR
Destination:	DAYTON, OH (DAY)	Type of Clearance:	IFR
Departure Time:	1933 MDT	Type of Airspace:	Class A

Wreckage and Impact Information

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	JAMES F STRUHSAKER	Adopted Date:	04/06/2001
Additional Participating Persons:	RICK HOSKER; DENVER, CO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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