



National Transportation Safety Board Aviation Incident Data Summary

Location:	MINNEAPOLIS, MN	Incident Number:	CHI89IA083
Date & Time:	05/02/1989, 1440 CDT	Registration:	N434AA
Aircraft:	MCDONNELL DOUGLAS DC-9-82	Injuries:	96 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

THE FLIGHT CREW REPORTED THAT WHILE IN CRUISE FLIGHT AT 33,000 FEET, THEY EXPERIENCED A HYDRAULIC SYSTEM FAILURE. THEY MANUALLY EXTENDED THE LANDING GEAR FOR LANDING AND MADE AN UNEVENTFUL NO FLAPS/NO SLATS LANDING. POST-ACCIDENT INVESTIGATION REVEALED THAT THE LOSS OF HYDRAULIC PRESSURE IN BOTH SYSTEMS WAS DUE TO THE FAILURE OF PTU S/O VALVE BODY ATTACH SCREWS ON THE LEFT SYSTEM VALVE. THIS ALLOWED THE LEFT VALVE BODY TO SEPERATE FROM THE REMAINING ASSEMBLY, PORTING LEFT SYSTEM HYDRAULIC FLUID OVERBOARD, AND SUBSEQUENTLY DEPRESSURIZING THE RIGHT SYSTEM (ALTHOUGH THERE WAS NO LOSS OF RIGHT SYSTEM HYDRAULIC FLUID). THE MANUFACTURER HAD A RE-DESIGNED, STRONGER UNIT AVAILABLE TO OPERATORS; THIS IMPROVED UNIT HAD STRONGER VALVE BODY ATTACH SCREWS, WELDED VALVE BODIES, STEEL GEARS, AND A SHEAR PIN IN THE MOTOR-TO-VALVE GEAR TRAIN.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this incident to be: FAILURE OF THE HYDRAULIC POWER TRANSFER UNIT SHUT-OFF (PTU S/O) VALVE DUE TO FAILED (FATIGUED) VALVE BODY ATTACH SCREWS.

Findings

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

Findings

1. (C) HYDRAULIC SYSTEM,SHUTOFF VALVE - FAILURE,TOTAL
2. (C) HYDRAULIC SYSTEM - NO PRESSURE

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

3. (C) TERRAIN CONDITION - RUNWAY
4. (C) HYDRAULIC SYSTEM - UNAVAILABLE

Pilot Information

Certificate:	Airline Transport	Age:	39
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Instrument Rating(s):	Airplane
Other Aircraft Rating(s):	None	Instructor Rating(s):	None
Flight Time:	7450 hours (Total, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MCDONNELL DOUGLAS	Registration:	N434AA
Model/Series:	DC-9-82 DC-9-82	Engines:	2 Turbo Fan
Operator:	AMERICAN AIRLINES	Engine Manufacturer:	P&W
Operating Certificate(s) Held:	Flag carrier (121)	Engine Model/Series:	JT8D-217A
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MSP, 841 ft msl	Weather Information Source:	Weather Observation Facility
Lowest Ceiling:	Broken / 7000 ft agl	Wind Speed/Gusts, Direction:	9 knots / , 290°
Temperature:	13°C	Visibility	20 Miles
Precipitation and Obscuration:			
Departure Point:	SEATTLE, WA (SEA)	Destination:	CHICAGO, IL (ORD)

Airport Information

Airport:	MINNEAPOLIS ST PAUL INTL (MSP)	Runway Surface Type:	Asphalt; Concrete
Runway Used:	29L	Runway Surface Condition:	Dry
Runway Length/Width:	10000 ft / 200 ft		

Wreckage and Impact Information

Crew Injuries:	6 None	Aircraft Damage:	Minor
Passenger Injuries:	90 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Latitude, Longitude:			

Administrative Information

Investigator In Charge (IIC): JODI L REEVES

Adopted Date: 08/26/1992

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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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.