
Severe pitch oscillations, McDonnell Douglas MD-11, November 25, 2000

Micro-summary: This McDonnell Douglas MD-11 experienced severe pitch oscillations.


Event Date: 2000-11-25 at 813 EST

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

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

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		NTSB ID: IAD01IA019		Aircraft Registration Number: N582FE	
		Occurrence Date: 11/25/2000		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place NEWARK		State NJ	Zip Code 07197	Local Time 0813	Time Zone EST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-11		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:					
<p>On November 25, 2000, at 0813 Eastern Standard Time, a McDonnell Douglas MD-11, N582FE, operated by Federal Express as flight 3015, was not damaged after experiencing pitch oscillations while climbing through 26,000 feet after takeoff from Newark International (EWR), Newark, New Jersey. The two certificated airline transport pilots were not injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight destined for Oakland, California. The scheduled cargo flight was conducted under 14 CFR Part 121.</p> <p>According to Federal Express, the first officer was hand flying the airplane. At 26,000 feet, the airplane began to pitch up and down at a fast rate. The captain took control of the airplane and leveled off. The airplane continued to pitch up and down, and the autopilot was then engaged and the airplane stabilized. The airplane was slowed to 230 knots and the autopilot was turned off. The pitch oscillations began again. The crew declared an emergency, and returned to EWR, and landed without incident.</p> <p>The crew remarked that while hand flying the airplane, the elevator pressure was similar to when the autopilot was engaged, and described it as a very heavy pressure. The autopilot remained engaged (auto pilot single alert) to 1,000 feet. The crew reported that there was very heavy pressure on the elevator during the landing.</p> <p>According to Federal Express, a maintenance write-up on November 22, 2000, revealed that the elevator had locked up and the airplane had to be flown with stabilizer trim to change pitch angle.</p> <p>Federal Express maintenance personnel at EWR examined the airplane. The number 1 flight control computer (FCC) was replaced, and the horizontal stabilizer jackscrews and chains were visually inspected and functionally tested. The number 1 and 2 FCC auto flight system (AFS) CAT3B return to service test (RTS) was performed and functionally tested okay. The electrical connectors on the left inboard actuator were replaced due to moisture contamination. Also, the right hand outboard elevator actuator shut off solenoid was replaced.</p> <p>The airplane was then test flown. During the test flight, the oscillations were again encountered. The left inboard elevator parallel engage solenoid shut off valve was then replaced and no further discrepancies were noted with the system.</p> <p>The valve was sent to the manufacturer for examination.</p> <p>The valve was examined at Parker Aerospace, Irvine, California, on January 19, 2001. Present for the examination were representatives of Parker Aerospace and Federal Express. Examination of the valve revealed that it was intact, and was assembled in accordance to manufacturer standards. The unit had accrued a total of 13,467 hours. The unit was electrically tested, and a short was found when tested between coil 1 and coil 2. At that time, no further electrical or hydraulic testing</p>					
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National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: IAD01IA019

Occurrence Date: 11/25/2000


Occurrence Type: Incident


Narrative (Continued)

was conducted due to the short. The unit was then disassembled. Examination of the unit revealed that moisture was found underneath the case assembly and around the coil assembly. The moisture appeared to be hydraulic fluid. The examination also revealed that the orange colored lead to coil 1, and the brown colored lead to coil 2 had fused together through the insulation and caused the electrical short.

It was not determined as to how the hydraulic fluid entered the valve, or if the fluid contributed to the electrical short.

According to a Boeing representative, the valve failure was not a common occurrence. At the time of this report, they were in the process of establishing a components team to research the possibility of fluid contamination in these valves.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: IAD01IA019			
		Occurrence Date: 11/25/2000			
		Occurrence Type: Incident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used 0	Runway Length	Runway Width
Runway Surface Type:					
Runway Surface Condition:					
Type Instrument Approach:					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-11		Serial Number 48420	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Tricycle					
Homebuilt Aircraft? No	Number of Seats:	Certified Max Gross Wt.	LBS	Number of Engines: 3	
Engine Type: Unknown	Engine Manufacturer:	Model/Series:	Rated Power:		
- Aircraft Inspection Information					
Type of Last Inspection Unknown	Date of Last Inspection	Time Since Last Inspection Hours	Airframe Total Time Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner FEDERAL EXPRESS		Street Address			
		City MEMPHIS	State TN	Zip Code 38194	
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: FEDEX EXPRESS			Operator Designator Code: FDEA		
- 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; Cargo					
FACTUAL REPORT - AVIATION					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: IAD01IA019
	Occurrence Date: 11/25/2000
	Occurrence Type: Incident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File		

Sex: F	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number:
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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.: Unknown	Medical Cert. Status: Unknown	Date of Last Medical Exam:
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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	3490	3136								
Pilot In Command(PIC)										
Instructor										
Last 90 Days	77	77								
Last 30 Days	28	28								
Last 24 Hours	7	7								

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	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		EWR	0000	

Destination	State	Airport Identifier	
OAKLAND	CA	OAK	


Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing: Company

Method of Briefing:

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: IAD01IA019
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Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
EWR	0751	EST	18 Ft. MSL	0 NM	0 Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 14000 Ft. AGL Condition of Light: Day

Lowest Ceiling: Overcast 22000 Ft. AGL Visibility: 10 SM Altimeter: 30.00 "Hg

Temperature: 2 °C Dew Point: 7 °C Wind Direction: 40 Density Altitude: Ft.

Wind Speed: 5 Gusts: 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: None 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					
Other Crew					
Passengers					
- TOTAL ABOARD -				2	2
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	2	2

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: IAD011A019

Occurrence Date: 11/25/2000

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

LEAH D. YEAGER

Additional Persons Participating in This Accident/Incident Investigation:

BILL STEELHAMMER
BOEING
LONG BEACH, CA

TONY ROBANO
PARKER AEROSPACE
IRVINE, CA