
Uncommanded yaw damper inputs, Boeing 747-123, May 18, 1998

Micro-summary: This Boeing 747-123 experienced uncommanded yaw damper inputs during cruise flight.


Event Date: 1998-05-18 at 0215 CDT

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

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

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		NTSB ID: CHI98IA164		Aircraft Registration Number: N675UP	
		Occurrence Date: 05/18/1998		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place MINNEAPOLIS	State MN	Zip Code 55425	Local Time 0215	Time Zone CDT	
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 747-123		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On May 18, 1998, at 0215 central daylight time, a Boeing 747-123, N675UP, operated by United Parcel Service (UPS) experienced uncommanded yaw damper inputs during cruise flight at FL350 while en route to Anchorage Alaska. The flight diverted to Minneapolis, Minnesota, where an uneventful landing was made. The captain, first officer, and flight engineer were not injured and the airplane was not damaged. The 14 CFR Part 121 cargo flight was operating on an IFR flight plan. The flight originated from Louisville, Kentucky, at 0159 eastern daylight time.</p> <p>While en route, the flight crew received an intermittent fire warning light and bell which they suspected was from the lower cargo area. They contacted UPS Maintenance Control using the VHF #2 transceiver and were unable to isolate the warning so they initiated a diversion to Minneapolis. While communicating with Maintenance Control the flight crew experienced several uncommanded "kicks" of the yaw damper. According to UPS, the flight crew turned off the upper yaw damper, but they did not turn off the lower yaw damper. They continued to experience "kicks" although not as severe. The flight landed at Minneapolis without incident at 0320 cdt.</p> <p>The crew write-up in the maintenance logbook regarding the uncommanded yaw damper "kicks" stated "Experienced rapid severe uncommanded flt control inputs in crz flt and then after with autopilots A or B or autopilot off, air divert to MSP." The crew reported during a debrief that the "kicks" occurred with either the "A" or "B" autopilots engaged. They reported turning the autopilot off at approximately FL150.</p> <p>A review of the Flight Data Recorder data indicated that approximately 45 minutes into the flight the #2 VHF was keyed at which time the upper rudder surface deflected left to a maximum of 3.3 degrees and the lower rudder surface deflected left to a maximum of 1.1 degrees. The data also shows that in addition to the yaw damper inputs, uncommanded movement of the control wheel occurred whenever the #2 VHF was keyed. The maximum control wheel movement was 16.9 degrees to the right. The control wheel deflections continued to occur after the upper yaw damper was disconnected as long as the autopilot was engaged.</p> <p>Maintenance inspection of the airplane after the incident revealed an open shield at the #2 VHF coax connector. The #2 VHF transceiver is located near the yaw damper couplers, and the pitch and roll computers. The connector was replaced and the airplane was returned to service.</p> <p>Inspection of the airplane did not reveal any evidence of a fire. The intermittent fire warning was corrected by maintenance personnel replacing the fire warning circuit card.</p> <p>On May 17, the day previous to this incident, a different flight crew who flew N675UP reported "When keying mic on #2 VHF (all three mics) Yaw Damper Kicks! Pulled #2 VHF CB [circuit breaker]." Maintenance inspection of the airplane after this event determined the #2 transceiver was unserviceable and it was replaced. Operational checks of the transceiver and yaw damper were</p>					
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National Transportation Safety Board

**FACTUAL REPORT
AVIATION**




NTSB ID: CHI98IA164


Occurrence Date: 05/18/1998

Occurrence Type: Incident

Narrative (Continued)

conducted and the airplane was put back in service.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: CHI98IA164			
		Occurrence Date: 05/18/1998			
		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:					
Aircraft Information					
Aircraft Manufacturer Boeing		Model/Series 747-123		Serial Number 20390	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Tricycle					
Homebuilt Aircraft? No	Number of Seats: 9	Certified Max Gross Wt.	734000 LBS	Number of Engines: 4	
Engine Type: Turbo Fan	Engine Manufacturer: P&W	Model/Series: JT9D-7AH	Rated Power: 46150 LBS		
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 05/1998	Time Since Last Inspection Hours	Airframe Total Time 58165 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner UNITED PARCEL SERVICE		Street Address 1400 N HURSTBOURNE PKY			
		City LOUISVILLE	State KY	Zip Code 40223	
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: UPS			Operator Designator Code: IPXA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Cargo					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Non-scheduled; Domestic; Cargo					
FACTUAL REPORT - AVIATION					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: CHI98IA164
	Occurrence Date: 05/18/1998
	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; Flight Engineer

Airplane Rating(s): Multi-engine Land; Single-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: 04/1998
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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	14500	595								
Pilot In Command(PIC)										
Instructor										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

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	
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Departure Point LOUISVILLE	State KY	Airport Identifier LOU	Departure Time 0000	Time Zone
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Destination ANCHORAGE	State AK	Airport Identifier ANC	
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Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing:
Company

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
	0000		0 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Unknown			0 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: Unknown		0 Ft. AGL	Visibility: 0 SM	Altimeter: "Hg	
Temperature: °C	Dew Point: °C	Wind Direction:		Density Altitude: Ft.	
Wind Speed:	Gusts:	Weather Conditions at Accident Site:			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0 SM	Intensity of Precipitation: Unknown			
Restrictions to Visibility:					
Type of Precipitation:					

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				1	1
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -				3	3
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	3	3

National Transportation Safety Board

FACTUAL REPORT

AVIATION



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Occurrence Date: 05/18/1998

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

PAMELA S. SULLIVAN

Additional Persons Participating in This Accident/Incident Investigation:

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