
Uncontained engine failure, Boeing 747-121, October 23, 1995

Micro-summary: This Boeing 747-121 experienced an uncontained engine failure on takeoff.


Event Date: 1995-10-23 at 0350 EDT


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


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

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		NTSB ID: MIA96FA013		Aircraft Registration Number: N613FF	
		Occurrence Date: 10/23/1995		Most Critical Injury: None	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place MIAMI	State FL	Zip Code 33152	Local Time 0350	Time Zone EDT	
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 747-121		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 October 23, 1995, about 0350 eastern daylight time, a Boeing 747-121, N613FF, registered to and operated by Tower Air, Inc., as flight 803, a 14 CFR Part 121 international cargo flight from Miami, Florida, to Port of Spain, Trinidad, sustained substantial damage when the No. 4 engine had an uncontained failure during takeoff from Miami. Visual meteorological conditions prevailed at the time and an instrument flight rules flight plan was filed. The airline transport-rated captain, first officer, flight engineer, and two extra crewmembers were not injured. The flight was originating at the time of the accident.</p> <p>The captain stated the first officer was performing the takeoff on runway 9L. Takeoff engine thrust was set at 1.42 EPR. All engines operated normally and the aircraft accelerated normally with no unusual vibration felt. Upon reaching the V 1 speed, they heard a loud bang and observed a flash on the right side of the aircraft. The aircraft veered slightly to the right. He, the captain, took control and rejected the takeoff. The flight engineer reported an engine failure. The aircraft was stopped on the runway about 1,000 feet from the departure end. The ATC local controller reported that the No. 4 engine was on fire. They performed the engine fire procedures and fired the engine fire bottles for the No. 4 engine. Airport emergency equipment arrived and extinguished the fire.</p> <p>Readout of the digital flight data recorder (DFDR) from N613FF was performed by Jeremy Akel, Aerospace Engineer, NTSB, Washington, D.C. The data shows engine power was set at 1.42 EPR on all engines and the aircraft accelerated. Upon reaching an indicated airspeed of 155 knots the No. 4 engine EPR dropped to .98. Upon reaching 162 knots the EPR on the remaining engines decreases to about 1.0 and the aircraft begins to decelerate. (See the Aerospace Engineer Memorandum.)</p> <p>Postaccident examination of the aircraft by NTSB personnel showed an uncontained failure occurred in the turbine area of the No. 4 engine. The engine, engine cowling, engine pylon, right wing, aileron, and flaps, fuselage, and right horizontal stabilizer sustained damage from debris released during engine failure. A 5 x 7 inch triangular shaped hole was cut into the right side of the fuselage, just aft of station 2,000 and 6 feet above the main cabin floor. A rib and longeron were severed behind the hole and the pressurized area of the airplane was compromised.</p> <p>Teardown examination of the No. 4 engine showed the low pressure turbine fifth stage turbine hub was missing about a 180 degree continuous arc of the rim, which includes the blade attachment slots. Five pieces of the rim were found on or to the side of runway 9L. The No. 5 hub was found to have ruptured from an area of a well oxidized, intergranular fracture that originated at a tierod hole. There was no apparent defect observed along the edge of the tierod hole that would cause a crack to initiate and propagate to a critical length. (See the Powerplant Group Chairman Factual Report and Metallurgist's Factual Report.)</p>					
FACTUAL REPORT - AVIATION					
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 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: MIA96FA013			
		Occurrence Date: 10/23/1995			
		Occurrence Type: Accident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
MIAMI INTERNATIONAL	MIA	11 Ft. MSL	9L	10502	200
Runway Surface Type: Asphalt					
Runway Surface Condition: Dry					
Type Instrument Approach: NONE					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
Boeing		747-121		19647	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 8	Certified Max Gross Wt.	734000 LBS	Number of Engines: 4	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	P&W	JT9D-7AH	46150 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	10/1996	0 Hours	22911 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
TOWER AIR INC		City	State	Zip Code	
		JAMAICA	NY	11430	
Operator of Aircraft		Street Address			
Same as Reg'd Aircraft Owner		Same as Reg'd Aircraft Owner			
		City	State	Zip Code	
Operator Does Business As:			Operator Designator Code: TWRA		
- 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: Non-scheduled; International; Cargo					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: MIA96FA013
	Occurrence Date: 10/23/1995
	Occurrence Type: Accident

First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 51
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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): 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--w/ waivers/lim.	Date of Last Medical Exam: 07/1995
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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	18000	6000	700	17300	5000	1000	200			
Pilot In Command(PIC)	9000	4000	700	8300						
Instructor										
Last 90 Days	181	181		181						
Last 30 Days	57	57		57						
Last 24 Hours	1	1		1						

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 Same as Accident/Incident Location	State	Airport Identifier MIA	Departure Time 0350	Time Zone EDT
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Destination PORT OF SPAIN	State OF	Airport Identifier TTPP	
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Type of Clearance: IFR

Type of Airspace: Class D

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
MIA	0450	EDT	11 Ft. MSL	1 NM	270 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			12000 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: None		0 Ft. AGL	Visibility: 7 SM	Altimeter: 29.00	"Hg
Temperature: 23 °C	Dew Point: 22 °C	Wind Direction: 20		Density Altitude: 1000	Ft.
Wind Speed: 3	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: Substantial	Aircraft Fire: Ground	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				2	2
Passengers					
- TOTAL ABOARD -				5	5
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	5	5

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: MIA96FA013

Occurrence Date: 10/23/1995

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

JEFFREY L. KENNEDY

Additional Persons Participating in This Accident/Incident Investigation:

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