



Aviation Investigation Final Report

Location:	FORT SMITH, Arkansas	Incident Number:	MKC871A034
Date & Time:	December 23, 1986, 06:20 Local	Registration:	N223AS
Aircraft:	EMBRAER EMB-120	BRASILIA	Aircraft Damage: Minor
Defining Event:		Injuries:	6 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Scheduled		

Analysis

THE FLIGHT CREW STATED THAT THEY WERE INITIATING A DESCENT INTO FINAL APPROACH FOR A LANDING WHEN THE RIGHT ENGINE GEARBOX CHIP DETECTOR LGITH ILLUMINATED FOLLOWED BY A LOUD BANG AND SEVERE VIBRATION.WHEN THE PROPELLER WAS FEATHERED AND THE ENGINE SHUT DOWN WITH THE CONDITION LEVER THE ROTATION AND VIBRATION STOPPED, THE CREW FURTHER STATED. THE AIRCRAFT LANDED WITHOUT FURTHER INCIDENT. A POST-INCIDENT TEARDOWN INSPECTION OF THE POWERPLANT AT THE FACTORY REVEALED A SUDDEN AND CATASTROPHIC FAILURE OF THE PROPELLER REDUCTION GEARBOX ASSEMBLY DUE TO A HIGH CYCLE, METAL FATIGUE FRACTURE ON ONE, OF TWO, HELICAL GEARS. TEARDOWN AND INSEPTION OF THE PROPELLER ASSEMBLY REVEALED SEVERE DAMAGE TO THE COMPOSITE PLASTIC BLADE RETAINER RINGS AND METAL ACTUATOR YOKES DUE TO SUDDEN DECELERATION AND STOPPAGE.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be:

Findings

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

Findings

1. (C) REDUCTION GEAR ASSY - FATIGUE
2. REMEDIAL ACTION - INITIATED - PILOT IN COMMAND

Occurrence #2: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF

Phase of Operation: DESCENT

Findings

3. ENGINE ASSEMBLY - FAILURE, TOTAL
4. EMERGENCY PROCEDURE - PERFORMED - PILOT IN COMMAND

Factual Information

Pilot Information

Certificate:	Airline transport; Commercial	Age:	24, Male
Airplane Rating(s):	Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	April 2, 1986
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	3460 hours (Total, all aircraft), 3260 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	EMBRAER	Registration:	N223AS
Model/Series:	BRASILIA EMB-120 BRASILIA E	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	120.021
Landing Gear Type:	Retractable - Tricycle	Seats:	32
Date/Type of Last Inspection:	AAIP	Certified Max Gross Wt.:	25353 lbs
Time Since Last Inspection:		Engines:	2 Turbo prop
Airframe Total Time:	329 Hrs	Engine Manufacturer:	P&W
ELT:		Engine Model/Series:	PW118
Registered Owner:	ATLANTIC SOUTHEAST AIRLINES	Rated Power:	1600 Horsepower
Operator:		Operating Certificate(s) Held:	Commuter air carrier (135)
Operator Does Business As:		Operator Designator Code:	ASOA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Dawn
Observation Facility, Elevation:	FSM ,469 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	06:55 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:	Unknown	Visibility	7 miles
Lowest Ceiling:	Overcast / 5500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	30°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	6°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	FAYETTEVILLE , AR (FYV)	Type of Flight Plan Filed:	IFR
Destination:	FORT SMITH , AR (FSM)	Type of Clearance:	IFR
Departure Time:	05:30 Local	Type of Airspace:	Class D

Airport Information

Airport:	FORT SMITH MUNICIPAL	Runway Surface Type:	Asphalt
Airport Elevation:	0 ft msl	Runway Surface Condition:	Dry
Runway Used:	0	IFR Approach:	None
Runway Length/Width:	0 ft / 0 ft	VFR Approach/Landing:	Straight-in

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Minor
Passenger Injuries:	4 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	6 None	Latitude, Longitude:	35.369861,-94.420082(est)

Administrative Information

Investigator In Charge (IIC):	Vargas, Ramon
Additional Participating Persons:	JOHN DORSEY; LITTLE ROCK , AR
Original Publish Date:	March 30, 1988
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=34305

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).