



Aviation Investigation Final Report

Location:	DFW AIRPORT, Texas	Incident Number:	FTW97IA119
Date & Time:	March 10, 1997, 13:21 Local	Registration:	N909PG
Aircraft:	Boeing 727-2K5	Aircraft Damage:	Minor
Defining Event:		Injuries:	4 None
Flight Conducted Under:	Part 129: Foreign		

Analysis

The right hand inboard main landing gear wheel assembly departed the aircraft during the takeoff roll. The crew returned the aircraft to the departure airport and the flight landed without further incident. Visual examination revealed that the outer cone-bearing seized. The bearing race, retainer ring, and axle were damaged and the inner ring of the outer wheel bearing exhibited deformation, rubbing, cracking, and galling. None of the bearing rollers were recovered. Metallurgical examination disclosed that the inner wheel bearing migrated approximately 1.5 inches in the inboard direction. The outer bearing ring showed rub damage on the circumference of the inner and outer diameter and the bearing cage. The bolt that locked the wheel retaining nut was fractured; however, it could not be determined if the fracture of the bolt contributed to or was the result of the bearing damage. The inner ring of the outer wheel bearing displayed heat damage and localized melting. The damage of the inner ring 'appeared to be more consistent with bearing deterioration caused by inadequate or loss of preloading rather than a bearing seizure event.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: failure of the outer bearing for undetermined reason(s).

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - ROLL/RUN

Findings

1. (C) LANDING GEAR,AXLE - UNDETERMINED
2. (C) LANDING GEAR,AXLE - FAILURE,TOTAL
3. LANDING GEAR,AXLE - SEPARATION
4. MISCELLANEOUS,BOLT/NUT/FASTENER/CLAMP/SPRING - FRACTURED
5. LANDING GEAR,AXLE - OVERTEMPERATURE

Factual Information

On March 10, 1997, at 1321 central standard time, a Boeing 727-2K5, N909PG, registered to Pegasus at San Francisco, California, operated by Aeromexpress as a Title 14 CFR Part 129 on demand cargo flight, experienced the separation of the number 3 main landing gear wheel during the takeoff at Dallas/Fort Worth International Airport, DFW Airport, Texas. Visual meteorological conditions prevailed and an instrument flight plan was filed. The 4 crew members were not injured and the airplane sustained minor damage.

Air Traffic Control personnel reported that the flight departed runway 35R with a planned destination of Mexico City, Mexico. During the departure climb, ATC personnel informed the crew that a wheel assembly had departed the aircraft. The crew reported to ATC that all cockpit indications were normal and they would return to the DFW Airport for landing. The flight landed on runway 35L without further incident.

Aeromexpress has operated the aircraft since July 1994, under an approved foreign air carrier aircraft maintenance program for 6,783:30 hours with 2,709 cycles. The last installation of the wheel and brake was accomplished on February 10, 1997. Total aircraft time was 40,423.07 hours with 17,036 cycles at the time of the wheel separation.

Inspection of the wheel by the FAA inspector and the investigator-in-charge revealed that the outer bearing race, retainer ring, and axle were damaged and the inner ring of the outer wheel bearing exhibited deformation, rubbing, cracking, and galling. None of the bearing rollers were recovered.

Metallurgical examination at Boeing disclosed that the inner wheel bearing of the right hand inboard main landing gear wheel assembly migrated approximately 1.5 inches in the inboard direction. The outer bearing ring showed rub damage on the circumference of the inner and outer diameter and the bearing cage. The bolt that locked the wheel retaining nut was fractured; however, it could not be determined if the fracture of the bolt contributed to or was the result of the bearing damage. The inner ring of the outer wheel bearing displayed heat damage and localized melting. The damage of the inner ring "appeared to be more consistent with bearing deterioration caused by inadequate or loss of preloading rather than a bearing seizure event." See the enclosed report for details of the examination.

Pilot Information

Certificate:	Airline transport	Age:	45,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	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	July 2, 1996
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	8000 hours (Total, all aircraft), 3727 hours (Total, this make and model), 5000 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	Registration:	N909PG
Model/Series:	727-2K5 727-2K5	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	21853
Landing Gear Type:	Retractable - Tricycle	Seats:	5
Date/Type of Last Inspection:	March 17, 1907 AAIP	Certified Max Gross Wt.:	197700 lbs
Time Since Last Inspection:	2585 Hrs	Engines:	3 Turbo fan
Airframe Total Time:	40423 Hrs	Engine Manufacturer:	P&W
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	JT8D-17
Registered Owner:	PEGASUS	Rated Power:	16000 Lbs thrust
Operator:	AEROMEXPRESS	Operating Certificate(s) Held:	None
Operator Does Business As:		Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Unknown	Visibility	10 miles
Lowest Ceiling:	Broken / 5500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	20°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	15°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(DFW)	Type of Flight Plan Filed:	IFR
Destination:	MEXICO CITY (MEX)	Type of Clearance:	IFR
Departure Time:	13:21 Local	Type of Airspace:	Class B

Airport Information

Airport:	DFW INTERNATIONAL DFW	Runway Surface Type:	Concrete
Airport Elevation:	603 ft msl	Runway Surface Condition:	Dry
Runway Used:	36R	IFR Approach:	None
Runway Length/Width:	11387 ft / 200 ft	VFR Approach/Landing:	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	4 None	Aircraft Damage:	Minor
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	Smith, Joyce
Additional Participating Persons:	MEL LAMAR; DFW AIRPORT , TX
Original Publish Date:	April 24, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=20064

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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](#).