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.ntsb.gov/Docket?ProjectID=20064