



National Transportation Safety Board Aviation Incident Final Report

Location:	Miami, FL	Incident Number:	ANC041A025
Date & Time:	02/19/2004, 1410 EST	Registration:	PH-MCL
Aircraft:	Boeing 767-300 ER	Aircraft Damage:	None
Defining Event:		Injuries:	290 None
Flight Conducted Under:	Part 129: Foreign		

Analysis

The flight crew of a Dutch registered Boeing 767-300 ER airplane reported that during landing rollout, as they applied the brakes, they noted a significant airframe vibration, and a pronounced rumbling noise. During a postincident inspection, maintenance personnel discovered a broken landing gear pivot pin on the right main landing gear truck. The landing gear bogie pivot pin was removed from the incident airplane's main landing gear bogie beam. A residual amount of dried grease was noted on the fractured pivot pin and associated bogie beam bushings. A senior materials engineer from the NTSB's Materials Laboratory reported that most of the chromium plating was missing from the pin's shank, and the underlying steel was worn, corroded, and displayed signs of heat damage. He noted that the originating fracture region contained corrosion pits. The fracture features noted are typical of stress corrosion cracking. The airplane's flight data recorder (FDR) showed that the incident landing was within normal operating tolerances. On April 8, 2004, Boeing Commercial Airplane Group issued Alert Service Bulletin 767-32A0199, which requires the replacement of the current pivot pins with pins made of a different type of steel. According to Boeing Commercial Airplane Group, the new steel is more resistant to heat damage, and less susceptible to stress corrosion cracking.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The inadequate quality of material in the main landing gear bogie pivot pin, which resulted in a premature fracture of the pin.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: LANDING - ROLL

Findings

1. (C) LANDING GEAR,MAIN GEAR - FRACTURED
2. (C) MATERIAL DEFECT(INADEQUATE QUALITY OF MATERIAL) - MANUFACTURER
3. LANDING GEAR,MAIN GEAR - STRESS CORROSION

Factual Information

On February 19, 2004, about 1410 eastern standard time, a Dutch registered Boeing 767-300 ER airplane, PH-MCL, had a landing gear component failure while landing at the Miami International Airport, Miami, Florida. The airplane was being operated by Martinair Holland, under Title 14, CFR Part 129, as an instrument flight rules (IFR) international cross-country scheduled passenger flight. There were no injuries to the two pilots, eight flight attendants, or the 280 passengers. Visual meteorological conditions prevailed, and an instrument flight plan was filed. The flight originated on February 19, about 0923 Universal Coordinated Time (UTC), from the Amsterdam Schiphol International Airport, the Netherlands, and was en route to the Miami International Airport.

The flight crew reported to their Miami based contract maintenance company personnel that during landing rollout on runway 12, as they applied the brakes, they noted a significant airframe vibration, and a pronounced rumbling noise as the airplane slowed. During a postincident inspection, maintenance personnel discovered a broken landing gear pivot pin on the right main landing gear truck.

On February 20, 2004, in the presence of the National Transportation Safety Board (NTSB) investigator-in-charge, the landing gear bogie pivot pin was removed from the incident airplane's main landing gear bogie beam. During the removal process, a residual amount of dried grease was noted on the fractured pivot pin and associated bogie beam bushings. The pivot pin was sent to the NTSB's Materials Laboratory in Washington, DC, for a metallurgical examination.

According to Martinair, the pivot pin was installed in the incident airplane in February of 2001. The pivot pin had attained 2,232 landing cycles prior to the event. According to Boeing Commercial Airplane Group, the landing gear bogie pivot pin has a 50,000 landing cycle limit.

According to the NTSB Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2) submitted by Martinair, the incident airplane had accumulated a total time of 63,592.6 flight hours. The most recent A check inspection was accomplished on February 12, 2004, 103.3 hours before the incident. According to Boeing Commercial Airplane Group, the landing gear bogie pivot pin should be lubricated during the A-check inspection.

A senior materials engineer from the NTSB's Materials Laboratory reported that most of the chromium plating was missing from the pin's shank, and the underlying steel was worn, corroded, and displayed signs of heat damage. He noted that the originating fracture region contained corrosion pits. The fracture features noted are typical of stress corrosion cracking. A complete copy of the NTSB's materials laboratory factual report is included in the public docket for this incident.

The airplane's flight data recorder (FDR) was removed and shipped to the NTSB's Washington, DC, laboratory for analysis. The FDR readout showed that the incident landing was within normal operating tolerances.

According to Boeing Commercial Airplane Group, nine operators of Boeing 767 airplanes reported ten additional pivot pin fractures, with six of the fractures being reported within the last two years. On January 20, 2004, Boeing Commercial Airplane Group issued a fleet team

digest (FTD) notice to operators of Boeing 767 airplanes, addressing cracked pivot pins, and the importance of correct grease usage. Boeing updates the FTD regularly, with the latest revision released December 16, 2004. In addition, the fleet team digest notice states, in part: "Boeing plans to release service bulletin 767-32A0199 which recommends that current pivot pins be replaced at overhaul, or heavy maintenance (D) check. SB release is currently planned for April-2004, based on availability of new pins."

On April 8, 2004, Boeing Commercial Airplane Group issued Alert Service Bulletin (ASB) 767-32A0199, which requires the replacement of the current pivot pins with pivot pins made of a different type of steel called Aermet 100. According to Boeing Commercial Airplane Group, Aermet 100 is more resistant to heat damage, and less susceptible to stress corrosion cracking.

The Safety Board shipped the FDR to Martinair in Holland on March 4, 2004. At the request of Martinair, the fractured landing gear bogie pivot pin was shipped to the Boeing Commercial Airplane Group, Seattle, Washington, on August 31, 2004.

Pilot Information

Certificate:	Foreign	Age:	34, Male
Airplane Rating(s):		Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):		Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Co-Pilot Information

Certificate:	Commercial	Age:	28, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	Registration:	PH-MCL
Model/Series:	767-300 ER	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	26469
Landing Gear Type:	Retractable - Tricycle	Seats:	292
Date/Type of Last Inspection:	02/12/2004, AAIP	Certified Max Gross Wt.:	412000 lbs
Time Since Last Inspection:	103 Hours	Engines:	2 Turbo Fan
Airframe Total Time:	63592 Hours as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, not activated	Engine Model/Series:	PW 4060-3
Registered Owner:	MARTINAIR HOLLAND	Rated Power:	60000 lbs
Operator:		Operating Certificate(s) Held:	Foreign Air Carrier (129)
Operator Does Business As:		Operator Designator Code:	MHLY

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	24° C
Precipitation and Obscuration:			
Departure Point:	Amsterdam (AMS)	Type of Flight Plan Filed:	IFR
Destination:	Miami, FL (MIA)	Type of Clearance:	IFR
Departure Time:	0923 UTC	Type of Airspace:	Class C

Airport Information

Airport:	MIAMI INTL (MIA)	Runway Surface Type:	Asphalt
Airport Elevation:	7 ft	Runway Surface Condition:	Dry
Runway Used:	12	IFR Approach:	Unknown
Runway Length/Width:	9354 ft / 150 ft	VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	10 None	Aircraft Damage:	None
Passenger Injuries:	280 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	290 None	Latitude, Longitude:	25.783333, -80.283333

Administrative Information

Investigator In Charge (IIC):	Clinton O Johnson	Adopted Date:	04/28/2005
Additional Participating Persons:	Paul Michel; Federal Aviation Administration - Miami IFO, SO; Miami, FL Robert T Larson; Boeing Commercial Airplane Group; Virginia Gardens, FL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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