



National Transportation Safety Board Aviation Accident Final Report

Location:	JAMAICA, NY	Accident Number:	DCA98MA084
Date & Time:	08/31/1998, 2235 üÇn	Registration:	N722DH
Aircraft:	Boeing 727-200	Aircraft Damage:	Substantial
Defining Event:		Injuries:	5 None
Flight Conducted Under:	Part 121: Air Carrier - Non-scheduled		

Analysis

Shortly after takeoff, the No. 2 engine failed and shutdown procedures for the No. 2 engine were accomplished. The flight crew declared an emergency and requested to return to the airport. On approach, an engine out go-around was required as ATC had instructed the flight crew of a B-747 to "position and hold" on the end of the runway. The first officer was the pilot flying. Following an uneventful touchdown, as the airplane slowed to about 80 knots, the captain took control of the airplane. Shortly thereafter, the right main landing gear (MLG) collapsed and the airplane slid to a stop on the runway. Examination of the No. 2 engine revealed that 80 percent of the main fuel pump main drive shaft was worn to the spline root. The examination also revealed that the grease used to lubricate the main drive shaft output splines was not the authorized grease specified per OHM 73-11-1 or MIL-G-81322. Additionally, the magnetic seal compression O-ring that rides on the drive gear journal outer diameter was hardened and exhibited inner diameter axial cracks. The component manufacturer indicated that the failure of the magnetic seal was the first such reported incident in 30 years; however, it agreed to review operational data from airlines to reevaluate the mean time between overhaul intervals for the seal and to recommend an inspection interval, as necessary. Examination of the right MLG revealed a fracture failure of the trunnion bearing support fitting that was caused by fatigue cracking and stress corrosion cracking.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the right main landing gear caused by fatigue cracking and stress corrosion cracking of the trunnion bearing support fitting.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CLIMB

Findings

1. 1 ENGINE
 2. (F) ACCESSORY DRIVE ASSY,DRIVE SHAFT - WORN
 3. (F) MAINTENANCE,LUBRICATION - IMPROPER - OTHER MAINTENANCE PERSONNEL
 4. (F) IMPROPER USE OF PROCEDURE - OTHER MAINTENANCE PERSONNEL
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Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: GEAR COLLAPSED
Phase of Operation: EMERGENCY LANDING

Findings

5. (C) LANDING GEAR,MAIN GEAR - COLLAPSED
6. (C) GEAR DOWN AND LOCKED - NOT MAINTAINED - COMPANY MAINTENANCE PERSONNEL
7. (C) PROCEDURE INADEQUATE - MANUFACTURER
8. (C) INSUFFICIENT STANDARDS/REQUIREMENTS,MANUFACTURER - MANUFACTURER
9. (C) LANDING GEAR,MAIN GEAR ATTACHMENT - FATIGUE
10. (C) LANDING GEAR,MAIN GEAR ATTACHMENT - STRESS CORROSION

Factual Information

On August 31, 1998, about 1035 eastern daylight time, a Boeing 727-200, N722DH, operated by DHL Worldwide Express as flight 1165, experienced a failure of the right main landing gear (MLG) shortly after making an emergency landing at John F. Kennedy International Airport, Jamaica, New York. The flight was operating under 14 Code of Federal Regulations Part 121 as a regularly scheduled cargo flight from New York to Cincinnati, Ohio. Shortly after takeoff, the No. 2 engine failed and shutdown procedures for the No. 2 engine were accomplished. The flight crew declared an emergency and requested to return to the airport. On approach,

an engine out go-around was required as ATC had instructed the flight crew of a B-747 to "position and hold" on the end of the runway. The first officer was the pilot flying. Following an uneventful[Haueter Tom] go around and touchdown, as the airplane slowed to about 80 knots, the captain took control of the airplane. Shortly thereafter, the right MLG collapsed and the airplane slid to a stop on the runway. None of the three flight crewmembers and two jumpseat passengers aboard were injured.

Examination of the No. 2 engine revealed that 80 percent of the main fuel pump main drive shaft was worn to the spline root. The examination also revealed that the grease used to lubricate the main drive shaft output splines was not the authorized grease specified per OHM 73-11-1 or MIL-G-81322. Additionally, the magnetic seal compression O-ring that rides on the drive gear journal outer diameter was hardened and exhibited inner diameter axial cracks.

The component manufacturer indicated that the failure of the magnetic seal was the first such reported incident in 30 years; however, it agreed to review operational data from airlines to reevaluate the mean time between overhaul intervals for the seal and to recommend an inspection interval, as necessary.

Examination of the right MLG revealed a fracture failure of the trunnion bearing support fitting that was caused by fatigue cracking and stress corrosion cracking.

As a result of this accident, the Safety Board issued Safety Recommendation A-99-4, which asked the Federal Aviation Administration to "require operators of all Boeing 727 series airplanes to (1) conduct periodic ultrasonic inspections of the main landing gear (MLG) forward trunnion bearing support fittings for corrosion, cracks, and stress corrosion cracking; (2) repair or replace these fittings if they are cracked or corroded; and (3) ensure that a proper moisture barrier is applied on new or existing MLG forward trunnion bearing support fittings to minimize corrosion."

On October 2, 2001, the Federal Aviation Administration issued Airworthiness Directive (AD) 2001-20-09. AD 2001-20-09 is applicable to all Boeing 727 series airplanes and requires repetitive ultrasonic inspections of the bearing support fitting of the forward trunnion on the MLG to detect corrosion and cracking, follow-on actions if necessary, and repair/rework of the support fitting.

Pilot Information

Certificate:	Airline Transport; Commercial	Age:	52, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	Yes
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	05/11/1998
Occupational Pilot:		Last Flight Review or Equivalent:	05/28/1998
Flight Time:	16000 hours (Total, all aircraft), 5000 hours (Total, this make and model), 160 hours (Last 90 days, all aircraft), 52 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Commercial	Age:	32, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	Yes
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	03/23/1998
Occupational Pilot:		Last Flight Review or Equivalent:	08/16/1998
Flight Time:	6000 hours (Total, all aircraft), 1200 hours (Total, this make and model), 137 hours (Last 90 days, all aircraft), 49 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Flight Engineer Information

Certificate:	Airline Transport; Commercial	Age:	51, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	
Other Aircraft Rating(s):		Restraint Used:	
Instrument Rating(s):		Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	Yes
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	07/01/1998
Occupational Pilot:		Last Flight Review or Equivalent:	08/16/1997
Flight Time:	7085 hours (Total, all aircraft), 1000 hours (Total, this make and model), 24 hours (Last 90 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Boeing	Registration:	N722DH
Model/Series:	727-200 727-200	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	19861
Landing Gear Type:	Retractable - Tricycle	Seats:	5
Date/Type of Last Inspection:	10/17/1996, Continuous Airworthiness	Certified Max Gross Wt.:	177600 lbs
Time Since Last Inspection:	2364 Hours	Engines:	3 Turbo Jet
Airframe Total Time:	50861 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	JT8D-7B
Registered Owner:	DHL AIRWAYS INC	Rated Power:	14000 lbs
Operator:	DHL AIRWAYS INC	Air Carrier Operating Certificate:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	DHLA

Meteorological Information and Flight Plan

Conditions at Accident Site:		Condition of Light:	Night/Dark
Observation Facility, Elevation:	, 0 ft msl	Observation Time:	0000
Distance from Accident Site:	0 Nautical Miles	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	21° C / 20° C
Lowest Ceiling:	Unknown	Visibility	10 Miles
Wind Speed/Gusts, Direction:	5 knots, 220°	Visibility (RVR):	0 ft
Altimeter Setting:	29.94 inches Hg	Visibility (RVV):	0 Miles
Precipitation and Obscuration:			
Departure Point:		Type of Flight Plan Filed:	IFR
Destination:	COVINGTON/CINCI, KY (CVG)	Type of Clearance:	IFR
Departure Time:	2200	Type of Airspace:	Class B

Airport Information

Airport:	JOHN F KENNEDY INTL (JFK)	Runway Surface Type:	Macadam
Airport Elevation:		Runway Surface Condition:	Dry
Runway Used:	22R	IFR Approach:	ILS
Runway Length/Width:	11351 ft / 150 ft	VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	5 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	Robert Macintosh	Adopted Date:	06/06/2003
Additional Participating Persons:	VICTORIA ANDERSON		
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.ntsbt.gov/pubdms/ .		

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