



National Transportation Safety Board Aviation Accident Final Report

Location:	Fort Lauderdale, FL	Accident Number:	MIA05FA123
Date & Time:	06/13/2005, 1550 EDT	Registration:	N3906J
Aircraft:	Douglas R4D-8	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	3 Serious
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The crew stated the airplane was hire by a private individual and had 220 gallons of fuel onboard, and was carrying 6 pieces of granite, weighing 3,200 lbs. The passenger was responsible for the granite during the flight. During takeoff, about 400 feet above the ground, a discrepancy with the left engine manifold pressure was noted, followed by a slight hesitation and mild backfire. Oil was seen leaking from the front nose section of the engine followed by an engine manifold pressure and rpm decrease. Smoke coming from the left engine was observed and reported by the airport controllers. The left engine's propeller failed to feather and the airplane wouldn't maintain altitude. The airplane impacted trees, vehicles, and the right wing struck a home before coming to a stop on the road. A fire ensued immediately after ground impact, all onboard exited without assistance. The fuselage from the cockpit to the tail section melted from the fire. The right wing was damaged by impact and fire, and the right engine remained intact on the wing. The left wing was separated 12 feet from the outboard and the engine separated from the firewall. Both engine's propellers were in the low pitch position. The flaps were full up and the landing gear were retracted. A weight and balance sheet was never furnished. The pieces of granite and limited cargo recovered from the wreckage weighed 3,140 lb. Examination of the airplane revealed all flight controls surface were present and flight control continuity was accounted for and established. No evidence of any pre-impact mechanical discrepancies with the airframe or its systems was found that would have prevented normal operation of airplane. On December 09, 2004, the left engine's nose section assembly was found with six out of the ten retaining bolts broken. The section was inspected and all ten bolts were replaced with serviceable ones. The assembly of the nose dome section and installation to the engine was performed by the repair station mechanic. The remaining assembling of the engine was completed by the operator's mechanic/pilot. During the left engine post accident examination, the ten bolts securing the nose dome section flange to the stationary reduction gear were fractured with their respective safety wire still intact. The chamber for the propeller feathering oil system was not secured to the plate sections, producing a by-pass of the oil for the propeller feathering process. Metal flakes and pieces were observed deposited in the oil breather screen, consistent with the master rod bearing in an advance stage of deterioration. The silver plated master rod bearing had a catastrophic failure. Silver like metal flakes and particles were observed throughout the nose section, reduction gear

section, main oil screen, and oil filter housing of the engine. An indication of propeller shaft housing movement was evident. Metal flakes with carbon build up were observed in the propeller shaft support and sleeve assembly. A metallurgical examination of the ten bolts securing the nose dome assembly indicated all were fractured though the threaded section of the shanks. The fatigue zones propagated from the opposite sides toward the center of the bolts consistent with reversed bending of the bolt.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The inadequate maintenance inspection by company maintenance personnel/pilot and other maintenance personnel of the left engine resulting in a total failure of the master rod bearing, and nose case partial separation, which prevented the left propeller from feathering. This resulted in the airplane not able to maintain altitude and a subsequent forced landing in a residential area.

Findings

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

Findings

1. (C) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
2. (C) MAINTENANCE,INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
3. ENGINE ASSEMBLY,BEARING - FAILURE,TOTAL
4. PROPELLER SYSTEM/ACCESSORIES,FEATHERING SYSTEM - SEPARATION
5. PROPELLER FEATHERING - NOT POSSIBLE - PILOT IN COMMAND
6. ALTITUDE - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

7. OBJECT - TREE(S)
8. OBJECT - RESIDENCE

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

9. TERRAIN CONDITION - RESIDENTIAL AREA

Factual Information

History of Flight

On June 13, 2005, about 1550 eastern daylight time, a Douglas Super R4D-8 (DC-3S), N3906J, registered to an individual, and operated by CB Transit Inc, doing business as Air Pony Express Inc, impacted into a residential area during a loss of engine power shortly after takeoff from the Fort Lauderdale Executive Airport, Fort Lauderdale, Florida. Visual meteorological conditions prevailed at the time and a visual flight rules flight plan was filed for the Title 14 CFR Part 91, international cargo flight to Marsh Harbour, Bahamas. The airline transport-rated pilot, airline transport-rated copilot, and one passenger received serious injuries. The airplane was destroyed. The flight was originating at the time of the accident.

The pilot stated that the cargo on the airplane was 6 pieces of granite, estimated to weigh 3,200 lbs, which he and the passenger loaded and secured with eight straps, rated at 10,000 lbs each. The passenger was in charge of the granite during the transporting. The airplane was hired by a private individual to have the granite delivered. The pilot and the co-pilot perform the preflight inspection of the airplane. The pilot further stated, the ground run up check prior to takeoff was completed and no discrepancies were noted. The takeoff through the initial climb was unremarkable. At the time to call for gear up, about 400 feet above the ground, he noted a discrepancy with the left engine manifold pressure. As the landing gear was being retracted he felt a slight hesitation and mild backfire from the left engine. He noted fuel and oil pressure for the left engine was normal. He looked toward the left engine and saw "a lot" of oil coming out of the front of the engine, and the engine's cowling was covered with oil. He then saw the left engine manifold pressure and rpm decrease. He called to the copilot to feather the left engine's propeller and the feathering button was activated. The pilot looked toward the left engine to confirm the feathering. The propeller did not feather and more oil was coming out of the front engine area. The throttle and fuel mixture for the left engine were secured and the pilot activated the left engine feathering button again. The propeller never went into the feathered position. By this time the left engine was indicating 400 rpm, and the airplane was losing altitude. At that time, the decision was made to put the airplane on the road. The pilot added, about 30 seconds had passed between the time he last attempted to feather the left engine's propeller to the impact on the road.

Shortly after the takeoff, the controller at the Fort Lauderdale Executive Airport tower advised the crew of the DC-3S they observed smoke coming from the left engine. The controller did not receive an acknowledgement from the crew. Several witnesses on the ground stated, they observed smoke coming from the accident airplane. Witnesses reported to the FAA that several cars in a parking lot along the flight path of the accident airplane were found with oil residue on them shortly after the accident.

Personnel Information

The pilot-in-command who was seated in the left seat was the holder of an airline transport pilot certificate with ratings for airplane multi-engine land, type rating BA-3100, DC-3, DC-3S, DC-6, and DC-7. Holder of a commercial pilot certificate with ratings for airplane single engine land, rotorcraft helicopter, glider, and instruments. Holder of a flight instructor certificate with ratings for airplane single and multi-engine, glider and instruments. Holder of a mechanic certificate with ratings of airframe and powerplant, and inspection authorization. He was issued a second-class medical certificate on July 29, 2004, with limitation of must wear

corrective lenses for distant. The pilot documented at the time of the medical a total of 18,000 flight hours in all aircraft.

The copilot who was seated in the right seat was the holder of an airplane transport pilot certificate with ratings for airplane multi-engine land, and a commercial certificate type rating for DC-3. Holder of a commercial pilot certificate with ratings for airplane single engine land, rotorcraft helicopter, instrument and a commercial certificate type rating for DC-3. Holder of a flight instructor certificate with ratings for airplane single and multi-engine, and instrument. He was issued a second-class medical certificate on July 26, 2004, with no limitation. The copilot documented at the time of the medical a total of 8,500 flight hours in all aircrafts.

Aircraft Information

FAA records indicate the accident airplane was a Douglas Super R4D-8 (DC-3S), manufactured in 1952, serial number (s/n) 43344. The accident airplane's engines were 2 each Curtis Wright R1820-80A with Hamilton Standard Propellers model 23E50. According to the airplane's maintenance records the airplane was on an Approve Airplane Inspection Program for CB Transit Inc. The last inspection performed to the airframe and engines was an "A" inspection on November 15, 2004, with a total time on the airframe of 19,623 hours, the left engine with 777 hours, and the right engine with 487 hours since overhauled respectively. The last unscheduled maintenance was performed on December 09, 2004, to the left engine, s/n: BL-519504, which had repairs to the nose section, at a total airframe time of 19,632 hours. According to the pilot /owner, the airplane's flight logbook was destroyed in the post crash fire and the exact total times for the airplane were unknown.

Weight & Balance

Neither the pilot nor the operator of the airplane provided a copy of the weight balance calculation for the accident flight. The copilot stated that the takeoff weight for the accident flight was 28,145 pounds, which included 220 gallons of fuel and 3,500 pounds of cargo, including the passenger and his belongings. The copilot further stated that the maximum takeoff weight for the airplane was 29,325 pounds, consistent with CB Transit, Inc. Weight and Balance Calculation Sheet. The granite and limited cargo that was recovered from the wreckage weighed 3,140 lb. Neither crew nor passenger recalled if the cargo was weighed on a certified scale for accuracy before the accident flight.

Meteorological Information

A METAR weather observation taken at the Fort Lauderdale Executive Airport at 1553 eastern daylight time, indicates that the wind was from 090 degrees at 10 knots, visibility 10 statute miles, scattered at 2,600, temperature and dew point were 85 and 71 degrees Fahrenheit, respectively, altimeter setting 29.88 inHg.

Communications

The crew of the accident airplane was in communication with the FAA Fort Lauderdale Executive Airport Control Tower up to and just after departure. Communications remained with them until the forced landing. The accident airplane was not equipped with a cockpit voice recorder or a flight data-recording device.

Wreckage and Impact Information

The airplane crashed while on a heading of 075 degrees. The main wreckage was located at position latitude 26 degrees, 11.88 minutes north and longitude 80 degrees, 07.44 minutes west, in a residential area, on the 1700 block of Northeast 56 Street, in Fort Lauderdale, Florida.

The initial impact was a 22 foot tall palm tree, which was about 456 feet from where the airplane came to a rest. A section of the left horizontal stabilizer was located 125 feet from the palm tree. The initial ground impact was 214 feet from the palm tree. Airplane wreckage and damaged tree debris were observed throughout the path of the initial impact point and the main wreckage. A fire ensued immediately after ground impact. The forward windshield cockpit instrument panel section aft to the tail section of the fuselage was melted from the fire, with little or no structure remaining. The tail section remained intact with fire damage.

The inboard left wing was intact to about the mid section with fire damage. The outboard missing 12 foot section of the left wing was located 300 feet aft of the main wreckage. The left engine separated from the firewall and came to rest a few feet in front of its respective position. One of the three propeller blades was bent forward from the mid span point. The other two propeller blades were bent aft from the mid span point with cord line scratches on each blade. All three blades were in a low pitch position. The fuel tank, located in the center section between the wing roots, was intact with puncture holes and fire damage.

The right wing was intact with several punctures in the leading edge and the lower side of the wing. The right aileron had a 4 foot section of a white painted wood facial board from a home 50 feet from the main wreckage, the board was lodged in the hinge section. The right engine was attached to the wing and the three propeller blades were bent aft from about mid span, in a low pitch position. Several tree branches and debris were lodged between the engine and the cowling behind the propeller.

The main landing gear were observed in the retracted position. The flap position was observed in the full up position with fire damage. Granite, in variable size and pieces, were observed throughout the cockpit and cargo area of the wreckage. The airplane clipped and uprooted several trees from private property, impacted a private home and damaged the roof and structure, damaged the adjacent public road, and damaged five privately owned motor vehicles.

Examination of the airplane upon recovery revealed all flight control surfaces were present and flight control continuity was confirmed. No evidence of pre-impact mechanical discrepancies with the airframe or its systems were found. The left engine, serial number (s/n): BL-519504, and propeller assembly, s/n: NKC1186, and the right engine, serial number: W-507585, and propeller assembly, s/n: NKC UC7347, were held for further examination.

Medical and Pathological

A post-accident toxicology studies on specimens obtained from the pilot and the copilot were performed by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The tests for the pilot and the copilot were negative for carbon monoxide, cyanide, ethanol, and drugs.

Research and Tests

According to the repair station's work order, number 98102, dated December 09, 2004, the following work was performed to the nose section assembly of the left engine. Disassembly of

the nose section and inspection for dimensional and visual condition; found six out of the ten bolts broken; all other parts in good condition; replaced all ten bolts (part number 2057D17) with serviceable bolts; replaced six each (part number 5015D3) rings with new rings. Reassembled nose section and installed on engine. The airplane's left engine maintenance records reflect the engine was checked before and after the ground run up following the repairs to the nose dome section and was return to service by the pilot, who had performed maintenance to the airplane. No entry was found for the removal and installation of the left propeller assembly after repairs were located in the maintenance records.

The mechanic from the repair station stated that he received a call from the pilot inquiring if the bolts on the nose section could be replaced and what was involved to complete the repairs. He informed the pilot that it required the removal, inspection, and repair of the nose section of the engine. The pilot informed him that he would perform the removal of the nose section. The mechanic, went to the airplane to check on the progress and assisted the pilot in removing the nose section of the engine, and took it to the repair station. After all the inspection and repairs were completed the nose section was returned to the airplane and installed by the mechanic with the assistance from the pilot. Once the nose section of the engine was installed, the mechanic then assisted the pilot with placing the propeller on the propeller shaft. The pilot completed the remaining installation of the propeller. On the following day, the mechanic called the pilot to inquire the outcome of the maintenance. The pilot informed the mechanic that there were no leaks and the engine performed satisfactorily during the performance test run.

A post accident examination of the left and right engines was conducted at a FAA certified repair station with NTSB oversight. Examination of the right engine established continuity of the engine. The only discrepancy discovered was with the number 5 cylinder aft spark plug. It was consistent with being in service for a lengthy period of time and not firing. When tested, the spark plug failed to produce spark. The spark plug high-tension lead for the number 5 cylinder aft plug would not deliver a spark when tested. The left and right magnetos produced sparks when tested. The main oil screen was unremarkable with carbon deposits consistent with normal operations.

The left engine's propeller feathering system was tested. A supply hose was connected from a propeller feathering test pump to the engine's prop governor. The propeller blades failed to move toward the feather position after five gallons of oil, under pressure, was pumped into the system. At that time, oil was observed leaking from the nose section of the engine and from the bottom cylinder's rocker covers, and push rod housing section; consistent with internal leaking of the propeller feathering system into the engine case. The ten bolts securing the crankcase front section flange to the stationary reduction gear were observed fractured with their respective safety wire still intact. When the nose section was removed, metal flakes and metal particles resembling silver were observed throughout the dome section and reduction gear section of the engine. Reduction gear bolts and safety wire were observed with wear rubbing marks against the gear reduction drive. Scrapes marks from the reduction gear on the inside of the housing was observed; consistent with prop shaft housing movement. The chamber for the propeller feather oil system was not secured to the plate sections, producing a by-pass of the oil for the propeller feathering process. The main oil screen was observed with large amounts of metal resembling silver flakes in the oil strainer housing and silver flakes deposited in the filter disks. The proper governor was removed and the screen gasket, on the engine side, was observed with metal deposits. Metal particles were observed in the metal chip detector and in

the geared section of the scavenge pump when removed. Marks from the counter weight on the crankshaft hitting against adjacent areas, due to exceeding its clearance limits, was observed when the number 3 cylinder was removed. The number 5 cylinder was removed and the aft side of the silver plated master rod bearing was observed with indications of a catastrophic failure. Deposits of metal flakes and pieces of metal were observed in the supercharger front housing breather screen area, consistent with the master rod bearing in an advanced stage of deterioration. The propeller shaft support and sleeve assembly was removed and the oil seals were intact. Metal flakes with carbon build up were observed in that section.

A total of twelve bolts, the stationary reduction gear, and the support and sleeve assembly were sent to the NTSB Material Laboratory for a metallurgical examination. The ten bolts that connect the support and sleeve assembly to the stationary gear, with equal distribution around the periphery of the stationary gear, were fractured through the threaded section of the shanks. Fatigue zones propagated from the opposite sides toward the center of the bolts consistent with reversed bending of the bolt. The bending direction was generally tangential to gear circumference for each bolt. The extent of fatigue varied from bolt to bolt and ranged from an estimated 50% to 90% of the bolt cross section. The remaining cross sections were consistent with overstress separation. Fatigue initiations were in the first or second thread roots engaged in the gear. This placed the fractures slightly below the support contacting surface of the gear. In some instances, the fractures initiated in both the first and second thread roots engaged in the gear. In several bolts, cracks were noted in adjacent unengaged threads. The bolt threads appeared typical of rolled threads with pitch of 24 threads per inch. The fracture plane of the bolt with overstress features was slightly above the gear surface. While the contacting surface of the gear was relatively undamaged, the mating surface of the support and sleeve assembly was heavily gouged and damaged consistent with rotational contact with the protruding overstressed bolts.

Additional Data/ Information

The wreckage excluding 12 bolts, one support sleeve assembly, and one gear stationary reduction component from the left engine was released to the owner's representative on July 07, 2005. The retained components from the left engine were released to the owner's representative on May 24, 2006.

Neither the pilot nor the operator submitted a Pilot/Operator Aircraft Accident/Incident Report (NTSB form 6120.1/2) as required by the Code of Federal Regulations Title 49, Part 830.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	62, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Glider; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	07/01/2004
Occupational Pilot:		Last Flight Review or Equivalent:	07/01/2003
Flight Time:	18000 hours (Total, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	56, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	07/01/2004
Occupational Pilot:		Last Flight Review or Equivalent:	03/01/2005
Flight Time:	8500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Douglas	Registration:	N3906J
Model/Series:	R4D-8	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	43344
Landing Gear Type:	Retractable - Tailwheel	Seats:	3
Date/Type of Last Inspection:	11/01/2004, AAIP	Certified Max Gross Wt.:	29325 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	19623 Hours as of last inspection	Engine Manufacturer:	Curtis Wright
ELT:	Installed, not activated	Engine Model/Series:	R1820-80
Registered Owner:	John Andrew	Rated Power:	1475 hp
Operator:	CB Transit Inc.	Operating Certificate(s) Held:	None
Operator Does Business As:	Air Pony Express, Inc.	Operator Designator Code:	XCOA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	FXE, 13 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	1553 EDT	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 2600 ft agl	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	90°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.88 inches Hg	Temperature/Dew Point:	29° C / 22° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Fort Lauderdale, FL (FXE)	Type of Flight Plan Filed:	VFR
Destination:	Marsh Harbour (MYAM)	Type of Clearance:	VFR
Departure Time:	1550 EDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Serious	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Serious	Latitude, Longitude:	26.196389, -80.123889

Administrative Information

Investigator In Charge (IIC):	Jose Obregon	Report Date:	07/25/2007
Additional Participating Persons:	Stephen Carl; Fort Lauderdale FSDO 17; Fort Lauderdale, 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/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).