



Aviation Investigation Final Report

Location:	Fishers, Indiana	Accident Number:	CHI07LA151
Date & Time:	May 19, 2007, 13:05 Local	Registration:	N411MD
Aircraft:	Piper PA 46-350P	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot stated that he crossed the "fence" at 90 knots and the touch down was soft on the main landing gear in the center of the runway. The pilot indicated that he "lightly applied toe brake pressure to slowdown the aircraft. ... Upon light toe brake pressure, we felt snap, and collapse of nose gear resulting in swerve to [left] of centerline - power setting was at IDLE when this occurred." An on-scene examination of the engine mount revealed a separation of the "new" one-piece foot design right attachment foot. Examination of the nose landing gear tire and rim revealed no pre-impact anomalies or under inflation. Examination of the engine mount revealed that "the upper aft part of the right nose gear actuator attachment foot fractured away from the rest of the engine mount. ... The fracture at the forward edge of the [right] foot had relatively smooth features on flat planes and showed curved crack arrest markings consistent with fatigue cracking from multiple origins. The fatigue cracking was evident over an arc of approximately 90 degrees; at its deepest penetration, the fatigue crack had propagated through approximately 90 percent of the estimated 0.07-inch wall thickness of the foot."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fatigue separation of the engine mount's nose gear actuator attachment foot during landing.

Findings

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

Phase of Operation: LANDING

Findings

1. (C) LANDING GEAR, NOSE GEAR - FATIGUE

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: LANDING

Findings

2. TERRAIN CONDITION - RUNWAY

Factual Information

On May 19, 2007, about 1305 eastern daylight time, a Piper PA 46-350P, N411MD, piloted by a private pilot, sustained substantial damage when the nose landing gear collapsed during landing on runway 15 (3,850 feet by 100 feet) at the Indianapolis Metropolitan Airport (UMP), near Fishers, Indiana. The personal flight was operating under 14 CFR Part 91. Visual meteorological conditions prevailed at the time of the accident. No flight plan was on file. The pilot and passenger reported no injuries. The flight originated from the Marion Municipal Airport, near Marion, Indiana, at 1250 and was destined for UMP.

In his accident report, the pilot stated that he crossed the "fence" at 90 knots and touched down on the main landing gear in the center of the runway. He said that the landing was soft on the mains. He said:

We rolled out 200-300-feet, in typical controlled manner. I then lightly applied toe brake pressure to slowdown the aircraft. ... Upon light toe brake pressure, we felt snap, and collapse of nose gear resulting in swerve to [left] of centerline - power setting was at IDLE when this occurred.

A witness observing the landing at the fixed base operator at UMP, in part, stated:

I observed a low wing single engine aircraft flying down final to runway 15 at Indianapolis Metropolitan Airport (KUMP). The approach and touchdown looked normal. The aircraft touched down within one or two centerline markings from the approach end numbers. The aircraft rolled out 200 to 300 yards and appeared to be decelerating with no problems. At that point what I believe to be smoke started to come from the nose wheel tire. The aircraft continued on for a short distance, at that time the nose gear collapsed and the propeller made contact with the runway surface. The plane slid maybe another 100 yards before coming to a stop on the left side of the runway. All Wheels were still on the runway surface and I did not see the aircraft make contact with anything else. Two people climbed out of the aircraft and waited for help to arrive. They did not appear to be injured.

Federal Aviation Administration Inspectors and an air safety investigator from Piper Aircraft Inc. examined the airplane. The examination of the engine mount revealed a separation of the right attachment foot that held an end of the nose landing gear actuator. The Piper investigator reported that the engine mount was of a "new" one-piece foot design.

N411MD, a 2000, PA-46-350P, serial number 4636262, was an all-metal airplane with semimonocoque fuselage and empennage construction. The airplane's last annual inspection was conducted on December 14, 2006. A logbook endorsement showed that the airplane Hobbs meter indicated 739.6 hours at the time of that inspection and that the new design engine mount, part number 89137-041, was installed on March 21, 2003, at a Hobbs meter reading of 229.8. The pilot reported that the airplane's total time at the time of the accident was 772 hours.

The nose landing gear's tire and rim were sent to the tire manufacturer for examination under Federal Aviation Administration supervision. The examination revealed no pre-impact anomalies or under inflation.

The engine mount was removed and was sent to the National Transportation Safety Board's Materials Laboratory. A materials research engineer examined the mount and produced Materials Laboratory Factual Report 07-098. That report, in part, stated:

The upper aft part of the right nose gear actuator attachment foot fractured away from the rest of the engine mount. ... The fracture at the forward edge of the [right] foot had relatively smooth features on flat planes and showed curved crack arrest markings consistent with fatigue cracking from multiple origins. The fatigue cracking was evident over an arc of approximately 90 degrees; at its deepest penetration, the fatigue crack had propagated through approximately 90 percent of the estimated 0.07-inch wall thickness of the foot. ... No cracks were observed in the joint where the left attachment foot was joined to the support tubes.

Pilot Information

Certificate:	Private	Age:	57, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Unknown	Last FAA Medical Exam:	March 1, 2007
Occupational Pilot:	No	Last Flight Review or Equivalent:	April 1, 2007
Flight Time:	1010 hours (Total, all aircraft), 600 hours (Total, this make and model), 910 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N411MD
Model/Series:	PA 46-350P	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	4636262
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	December 1, 2006 Annual	Certified Max Gross Wt.:	4650 lbs
Time Since Last Inspection:	32.4 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	772 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540-AE2A
Registered Owner:	RHED AVIATION INC.	Rated Power:	350 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	IND,797 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	11:54 Local	Direction from Accident Site:	220°
Lowest Cloud Condition:	Few / 13000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	13 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.22 inches Hg	Temperature/Dew Point:	22°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	MARION, IN (MZZ)	Type of Flight Plan Filed:	None
Destination:	(UMP)	Type of Clearance:	None
Departure Time:	12:50 Local	Type of Airspace:	

Airport Information

Airport:	INDIANAPOLIS METROPOLITAN UMP	Runway Surface Type:	Asphalt
Airport Elevation:	811 ft msl	Runway Surface Condition:	Dry
Runway Used:	15	IFR Approach:	None
Runway Length/Width:	3850 ft / 100 ft	VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	39.936668,-86.05278

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Randy A Shafer; Federal Aviation Administration; Indianapolis, IN Michael McClure; Piper Aircraft Inc.; The Colony, TX
Original Publish Date:	March 31, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65828

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