



National Transportation Safety Board Aviation Accident Final Report

Location:	PANAMA CITY, FL	Accident Number:	ATL98LA069
Date & Time:	05/01/1998, 1300 CDT	Registration:	N4121W
Aircraft:	Piper PA-32-300	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane experienced a catastrophic engine failure, and the pilot executed an emergency landing near Panama City, Florida. During the flare, the left wing impacted a utility pole causing substantial damage to the airplane. Examination of the engine revealed that the crankshaft had fractured at the connection rod thrust surface adjacent to the front fillet radius of No. 6 crankpin journal. Metallurgical examination concluded that the crankshaft fractured in fatigue at the connection rod thrust surface, adjacent to the front fillet radius of the No. 6 crankpin journal due to high stress. However, exact cause of the high stress remains undetermined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The engine crankshaft fracturing, leading to total powerplant failure. Contributing to the severity of the accident was a utility pole.

Findings

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

Findings

1. (F) ENGINE ASSEMBLY,CRANKSHAFT - SHEARED
 2. (F) POWERPLANT - FAILURE,TOTAL
 3. EMERGENCY PROCEDURE - PERFORMED - PILOT IN COMMAND
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Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings

4. (F) TERRAIN CONDITION - HIDDEN OBSTRUCTION(S)

Factual Information

On May 1, 1998, about 1300 central daylight time a Piper PA-32-300, N4121W, collided with a utility pole during an emergency landing on Highway 20, 12 miles north of Panama City, Florida. The airplane was operated by the pilot under the provisions of Title 14 CFR Part 91, and visual flight rules. Visual meteorological conditions prevailed and no flight plan was filed for the local flight. The private pilot and one passenger sustained minor injuries, and the airplane sustained substantial damage. The flight originated from Perry, Georgia at 1230.

According to the FAA, the airplane experienced a catastrophic engine failure, and the pilot executed an emergency landing onto Highway 20. During the flare, the left wing impacted a utility pole causing substantial damage to the airplane.

The pilot stated that 10 minutes before his intended arrival time, the engine began to develop a loud noise. The oil temperature, oil pressure, and manifold pressure gauge readings were all normal. The fuel pressure gauge was fluctuating rapidly. Within a few seconds, the engine surged and then lost partial power. As the pilot began to look for a suitable landing site, the engine surged again and vibrated briefly. At 800 feet above the ground, as the pilot approached his intended landing site, the engine began to vibrate severely, and the airplane became difficult to control. The pilot stated he then brought the mixture control to idle, and the propeller stopped. The pilot then noticed a utility pole on the right side of the airplane. The right wing struck the pole, and the airplane struck the ground in a nose down attitude. The airplane bounced and struck the ground again.

The investigation found that the engine failure was a result of a broken crankshaft. The Crankshaft had 1259.2 hours of service since the last major overhaul was performed with a TBO (To be overhauled) of 2000 hours. The crankshaft was submitted to the Materials Laboratory by the FAA through Engineering-Accident Investigation to determine the mode of the failure.

Metallurgy Report

Magnetic particle inspection of the crankshaft revealed very distinctive radial heat cracks at the connecting rod thrust surfaces, adjacent to the front and rear filler radii of all the crankpin journals except No. 6 crankpin journal. These results indicated that radial heat cracks most likely occurred after crankshaft separation.

Visual and macroscopic examination of the part revealed severe corrosion at the seal diameter and behind the prop flange. Examination revealed the crankshaft had broken at the connection rod thrust surface adjacent to the front fillet radius of NO. 6 crankpin journal. Heavy scuffing was observed at all the connection rod thrust surfaces where heat cracks were present. Examination of the crankshaft fracture surfaces revealed the mode of fracture was fatigue as evidenced by the presence of the typical "beach marks" at the crack propagation zone. Severe rubbing and damage were present on the fracture surfaces and the fatigue origin area.

Scanning electron microscope (SEM) examination at the fatigue origin revealed smeared surfaces due to rubbing with the mating surfaces. Two additional cracks, which are parallel to the main fatigued surface, were present in the vicinity of the fatigue origin area. One of the two cracks revealed no single fatigue origin indicating the area cracked in fatigue initiation from multiple origins. Striations, which are characteristic of fatigue fractures, were not observed in

most of the crack propagation zones.

Microscopic examination of the crankshaft at the fatigued area revealed no abnormal microstructure except additional cracks and the damaged surface. The connection rod thrust surface near the fatigue origin most likely was damaged as a secondary effect.

The Metallurgical Laboratory concluded that the crankshaft fractured in fatigue at the connection rod thrust surface, adjacent to the front fillet radius of No. 6 crankpin journal. The primary cause of the crankshaft failure most likely occurred as a result of being subjected to high stress. However, the exact cause of the abnormally high stress is not known. (See attachment for complete Metallurgical Report).

Pilot Information

Certificate:	Private	Age:	42, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	04/22/1998
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	631 hours (Total, all aircraft), 576 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N4121W
Model/Series:	PA-32-300 PA-32-300	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	32-40213
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540-K1A5
Registered Owner:	DANA P. DICKSON	Rated Power:	300 hp
Operator:	DANA P. DICKSON	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PFN, 21 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	1350 CDT	Direction from Accident Site:	90°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	27° C / 12° C
Precipitation and Obscuration:			
Departure Point:	PERRY, GA (PXE)	Type of Flight Plan Filed:	None
Destination:	(PFN)	Type of Clearance:	VFR
Departure Time:	1200 EDT	Type of Airspace:	Class D

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	BUTCH WILSON	Report Date:	05/19/1999
Additional Participating Persons:	RODGER HOLMSTROM REGAN H CAMPBELL		
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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