Aviation Investigation Final Report

Location:	Palakta, Florida	**Accident Number:**	NYC08LA264
Date & Time:	August 3, 2008, 02:46 Local	**Registration:**	N39758
Aircraft:	Piper PA-32RT-300T	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane struck trees shortly after takeoff during an early morning departure. The flight was the second leg of a trip which had begun the previous day, but then was delayed when a passenger required medical care. The pilot reported that the takeoff roll "seemed a little long," and that the engine began losing power immediately after becoming airborne. The airplane was not able to maintain altitude, and subsequently struck a tree, impacted the ground, and caught fire. The pilot and passenger exited the airplane via the rear door. Examination of the airplane and engine did not reveal evidence of any pre-impact mechanical discrepancies that would have prevented a successful takeoff. However, the cockpit area was destroyed, and the engine control friction lock tension could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The partial loss of engine power for undetermined reasons.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (partial)
Initial climb	Stall warn/stick-shaker/pusher
Uncontrolled descent	Loss of engine power (total) (Defining event)
Initial climb	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

HISTORY OF FLIGHT

On August 3, 2008, about 0246 eastern daylight time (EDT), a Piper PA-32RT-300T, N39758, was substantially damaged when it struck trees, and then impacted the ground, during the initial climb after takeoff from Palatka Municipal Airport, Lt. Kay Larkin Field (28J), Palatka, Florida. The certificated private pilot and passenger sustained minor injuries. Visual night meteorological conditions prevailed, and no flight plan had been filed for the second leg of a personal flight destined for Herlong Airport (HEG), Jacksonville, Florida. The flight was conducted under 14 Code of Federal Regulations Part 91.

The accident flight originated from Birmingham International Airport (BHM), Birmingham, Alabama approximately 1830 EDT, with the pilot and two passengers on board, all family members. The final destination was Kendall-Tamiami Executive Airport (TMB), Miami, Florida, and a possible intermediate fuel stop was planned for 28J. While in cruise flight a 15 knot headwind was encountered, and the fuel stop was required. The airplane landed at 28J about 2120 EDT. After the airplane was refueled, one of the passengers was found unconscious in the fixed base operator's building, and was transported to a local hospital. Approximately three hours later it was determined that the passenger would need to be airlifted to a hospital in Jacksonville, Florida. The pilot and the remaining family member decided that they would depart for HEG in the accident airplane.

The pilot elected to depart from runway 17 because the windsock indicated a light wind out of the southeast. The pilot reported that the airplane appeared to "accelerate okay," but that the takeoff roll "seem[ed] to be a little long." After achieving a speed of 75 knots, the airplane started its initial climb. Once a positive climb rate was established, the pilot initiated the landing gear retraction and, observed the "gear in transit" light illuminate. He then retracted the flaps, heard a brief sound from the stall indicator horn, and subsequently "reduced the airplane pitch attitude to achieve an airspeed of 70 knots." He then observed the manifold pressure indication of 33 inches, and "pushed it back up to 36 inches," however the airplane did not accelerate. In order to gain altitude, the pilot then selected "one notch of flaps." The airplane struck a tree, rotated approximately 180 degrees pointing the airplane back the direction it just traveled as it impacted the ground, and came to rest. The pilot and passenger saw fire coming

from the right wing, and they exited the airplane via the rear door.

The owner of the property adjacent to the accident site had been awakened by a helicopter, and she subsequently heard the accident airplane attempt to take off from the airport. She reported in a phone interview with a National Transportation Safety Board (NTSB) investigator that "it sounded like a training flight where they shut off the engine." She said that she heard the airplane impact the tree, and then saw the light and sound of the explosion that followed.

PERSONNEL INFORMATION

The pilot age 64, held a private pilot certificate with single-engine land and instrument airplane ratings. The pilot also held a United States Military Certificate and was a Military Instructor Pilot. His most recent Federal Aviation Administration (FAA) third-class medical certificate was issued on May 18, 2007, with limitations for corrective lenses. The pilot's logbook was consumed by the post crash fire. The pilot estimated that he had 4,500 hours of total flight experience, including 1,500 hours of flight experience as a military instructor pilot, and 1,200 hours as a civilian pilot. He also estimated that he had 750 hours of flight experience in the accident airplane make and model, including 3 hours of night flight experience within the last 90 days.

AIRCRAFT INFORMATION

The six-seat, low-wing, retractable-gear airplane, was manufactured in 1978. It was powered by a Lycoming TIO-540-S1AD, 300-horsepower engine, and equipped with a Hartzell controllable-pitch propeller. Review of maintenance records showed that an annual inspection was completed on July 11, 2008. At that time the airframe had a total time in service of 3,462.6 hours, and the engine had accumulated 1,573.1 hours since overhaul. The pilot reported that the airplane had accumulated approximately 15 hours since the annual inspection.

METEOROLOGICAL INFORMATION

The 0255 recorded weather at St. Augustine Airport (SGJ), St. Augustine, Florida, located 26 miles to the northeast of the accident airport, reported calm winds, visibility 10 miles, clear skies, temperature 23 degrees C, dew point 22 degrees C, and an altimeter setting of 29.96 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

Examination of the airplane by an FAA inspector revealed that the engine had separated from the firewall and remained inside the cowling. The two bladed propeller was oriented perpendicular to the ground. The upper blade showed no evidence of rotational scoring, the lower blade was bent forward, and the spinner was crushed. The cabin and cockpit area had been consumed by fire. Control continuity was verified from the right wing root to the right wing aileron and from the aft cabin bulkhead to the rudder. The left wing was intact, and the

left wing fuel tank was full of fuel. The cabin and cockpit area had been consumed by fire.

Engine Examination

Post recovery examination of the engine was conducted at the recovery facility by representatives of the engine manufacturer, airplane manufacturer, and the FAA.

The engine did not display any external indications of mechanical failure or malfunction. Engine control cable continuity was established visually from the firewall to each respective rod end connection for the throttle, mixture, and propeller governor. The throttle was found in the closed position, the mixture was full rich, and the propeller control was at high rpm. The friction lock tension for these controls was unable to be determined. The lubrication system contained a normal quantity of clean oil, and the oil filter and suction screen were examined, and found to be free of any contamination. The turbocharger system components were examined and no defects were found. The turbine exhaust bypass valve was intact, and was spring loaded in the open position, and the turbo manifold pressure relief valve was intact. The turbo turned freely by hand, and both the compressor impeller and turbine wheel were intact. The fuel pump was found to be attached to the case. The fuel pump drive shaft was intact, rotated freely by hand, and pumped fuel when rotated. The fuel system was found to contain clean fuel, and the servo regulator plug was found secure and wired.

The magneto system harness leads and spark plugs were intact, and produced sparks from all towers when rotated by hand. The top spark plugs were removed, and their appearance was consistent with normal operation. All six cylinders produced compression when the engine was rotated. A lighted borescope was used to examine the internal top end components, and no pre-impact anomalies were found.

TEST AND RESEARCH

In a phone interview with the NTSB, the pilot stated that he awoke about 0800, worked in the yard most of the day, and then took a nap of less than 45 minutes while a family member drove him to the airport. He further stated that it is possible that his habit is "to remove my hand from the throttle during departure" in order to raise the landing gear, trim the airplane, and manipulate other controls. He said that it is possible that the throttle "worked its way back" after he removed his hand, which resulted in a reduced power setting.

According to the Aeronautical Information Manual (AIM), a pilot can self assess his ability to fly by applying a personal checklist known as IMSAFE. This acronym stands for Illness, Medication, Stress, Alcohol, Fatigue, and Emotion. The AIM stated that "Stress and fatigue can be an extremely hazardous combination..." The AIM also stated that "the emotions of anger, depression, and anxiety… not only decrease alertness but also may lead to taking risks…any pilot who experiences an emotionally upsetting event should not fly until satisfactorily recovered from it."

According to a pilot safety brochure produced by the FAA's Civil Aerospace Medical Institute, Fatigue in Aviation, Medical Facts for Pilots (OK-07-193) states in part, "Fatigue leads to a decrease in your ability to carry out tasks…significant impairment in a person's ability to carry out tasks that require manual dexterity, concentration, and higher-order intellectual processing. Fatigue may happen…in a relatively short time (hours) after some significant physical or mental activity…" The brochure further provided recommendations for ways to combat fatigue; one recommendation was to "Get into the habit of sleeping eight hours per night. When needed, and if possible, nap during the day, but limit the nap to less than 30 minutes. Longer naps produce sleep inertia, which is counterproductive."
In January 1998 the Battelle Memorial Institute and JIL Information systems produced a paper entitled "An Overview of the Scientific Literature Concerning Fatigue, Sleep, and the Circadian Cycle." This was prepared for the FAA Office of the Chief Scientific and Technical Advisor for Human Factors. This paper defined fatigue as the deterioration in human performance, arising as a consequence of several potential factors, including sleepiness. It stated that "there is a loss in the ability of the worker to perceive and adjust to new aspects of the task. The worker seems unable to shift quickly and effectively from one subpart to another. The latter quality has been found to be a factor when aircraft crews are concentrating on one problem and allow other problems to develop due to neglect." The paper stated further that "night operation are physiologically different than day operations due to circadian trough and sleep loss. This carries a higher physiological cost and imposes greater risks of accidents. One of the most established safety issues is working in the circadian trough between 0200 and 0600. During this period workers experience considerable sleepiness, slower response times, increased errors and accidents."

An article in the Journal of Experimental Psychology (2000, Vol. 6, No. 3), entitled "The Impact of Sleep Deprivation of Decision Making: A Review, Appreciating a Complex Situation While Avoiding Distractions," states that fatigue study participants were "less appreciative of an increasingly complex situation and responded by applying more effort to pointless areas of their decision making, which had little or no effective outcome."

In an article produced for the Journal of Sleep Research titled "Neural Basis of Short-term Sleep Deprivation" written for the United States Government in 1999 states that "two cardinal features of sleep deprivation are diminished alertness and cognitive performance…simple task performance impaired, as reflected by tests of reaction time, vigilance, and attention."

A research paper published in the Seminars in Neurology (volume 25, number 1 2005), entitled "Neurocognitive Consequences of Sleep Deprivation," stated that "sleep deprivation whether acute or chronic, poses significant cognitive risks in the performance of many ordinary tasks."

Pilot Information

Certificate:	Military; Private	**Age:**	64,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 3 With waivers/limitations	**Last FAA Medical Exam:**	May 18, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 16, 2007
Flight Time:	4500 hours (Total, all aircraft), 750 hours (Total, this make and model), 4400 hours (Pilot In Command, all aircraft), 25 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N39758
Model/Series:	PA-32RT-300T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-78877162
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	July 11, 2008 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	15 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3477 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	TIO-540-S1AD
Registered Owner:	Takita LLC	**Rated Power:**	300 Horsepower
Operator:	Takita LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	GNV,152 ft msl	**Distance from Accident Site:**	35 Nautical Miles
Observation Time:	02:53 Local	**Direction from Accident Site:**	276°
Lowest Cloud Condition:	Clear	**Visibility**	9 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	23°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Palakta, FL (28J)	**Type of Flight Plan Filed:**	None
Destination:	Jacksonville, FL (HEG)	**Type of Clearance:**	None
Departure Time:	02:45 Local	**Type of Airspace:**	

Airport Information

Airport:	Paltaka Municiple Airport 28J	**Runway Surface Type:**	
Airport Elevation:	49 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	29.641111,-81.684722

Administrative Information

Investigator In Charge (IIC):	Etcher, Shawn
Additional Participating Persons:	Billy Meadows; FAA/ FSDO; Orlando, FL Edward Rogalski; Lycoming; Williamsport, PA Ron Maynard; Piper Aircraft, Inc.; Vero Beach, FL
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68583