Aviation Investigation Final Report

Location:	San Dimas, California	**Accident Number:**	LAX08FA109
Date & Time:	April 15, 2008, 20:41 Local	**Registration:**	N4080P
Aircraft:	Piper PA-23-160	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor intended to demonstrate the airplane to the pilot rated passenger. The owner of the flight school that owned the airplane said that the flight was not authorized and that she had no knowledge that the instructor was going to take the airplane. The owner said that the airplane had been down for an annual inspection for 6 weeks and the mechanic had not completed the work. The mechanic said the left main fuel tank was empty when he last worked on the airplane 4 days before the accident. No records were found indicating the airplane was refueled prior to the accident flight. The flight instructor claimed that during his preflight inspection, he checked the fuel by opening each fuel tank and estimated there were 25 gallons in each main tank. The instructor said that the left engine lost all power immediately after liftoff, but he did not abort the takeoff. He was unable to maintain airspeed and altitude and the airplane banked left and descended to ground impact. The passenger reported that the airplane "fishtailed" from right to left during the takeoff roll, and that he yelled at the instructor to abort the takeoff several times; however, the flight instructor continued the takeoff. After lifting off, the flight instructor held the control wheel in the full left aileron position and was trying to make left rudder inputs. The passenger yelled at the flight instructor to add right rudder as the instructor added left rudder trim. As the passenger was readjusting the rudder trim to the right, the airplane hit the ground. During examination of the wreckage, no fuel was noted in the left main tank, and 10 gallons of fuel were drained from the right main tank. The fuel selectors were positioned to the main tanks. No evidence of preimpact mechanical anomalies were noted during examination of the left and right engines. The owner's manual for the airplane states that if an engine fails after leaving the ground, but with sufficient landing area ahead, a landing should be effected immediately. The takeoff was on a 4,839-foot-long runway and the airplane likely became airborne in about 1,000 feet, and there was adequate distance left to land the airplane back on the runway.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power in the left engine due to fuel starvation as a result of the pilot's inadequate preflight inspection and the pilot's failure to abort the takeoff following the power loss.

Findings

Aircraft	Engine out control - Not attained/maintained
Personnel issues	Lack of action - Pilot
Personnel issues	Preflight inspection - Instructor/check pilot
Aircraft	Fuel - Inadequate inspection

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Initial climb	Fuel starvation
Initial climb	Loss of engine power (total)
Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On April 15, 2008, about 2041 Pacific daylight time, a Piper PA-23-160, N4080P, impacted terrain in Bonelli Regional Park, San Dimas, California, following a loss of control during initial climb after takeoff from runway 26L at Brackett Field Airport, La Verne, California. The flight instructor and the pilot rated passenger sustained serious injuries, and the airplane sustained substantial damage. The airplane was registered to Blue Diamond Aviation, La Verne, and was being operated by the pilot under Title 14 Code of Federal Regulations Part 91. Night visual meteorological conditions prevailed, and no flight plan was filed for the local instructional flight that was originating when the accident occurred.

According to the owner of Blue Diamond Aviation, the flight was not authorized, and she had no knowledge that the flight instructor was planning to take the airplane. The owner reported that the airplane had been down for annual inspection since February 26, 2008, and the mechanic had not completed the work. The owner further reported that there was an aircraft status board in the office on the wall behind the front desk; the board showed the airplane was down for maintenance.

The mechanic reported that on April 11, 2008, he attempted to drain fuel from the airplane's left main fuel tank, was unable to do so, and then determined that the left main tank was empty. Between 1900 and 2000 on April 11, he taxied the airplane to a tie down area. In order to start the left engine, he used the cross feed, then he switched to the left aux tank, which contained about 10 gallons of fuel.

A student of Blue Diamond Aviation reported that on April 13, 2008, he and the flight instructor taxied the airplane from the tie down area to a parking spot in front of the Blue Diamond office.

On April 14, 2008, the owner noted the airplane was parked in front of the office. She called the mechanic and he reported that the annual inspection was not completed. As the airplane was very dirty, the owner told the mechanic the airplane needed to be washed as soon as possible. On April 15, 2008, a Blue Diamond flight instructor (not the accident pilot) taxied the airplane to the wash rack about 1030, and taxied the airplane back to Blue Diamond about 1200 after it

was washed.

A check of the fuel records for Brackett Field from April 13 to 15 showed no fuel pumped into the accident airplane.

The accident flight instructor was interviewed by a Federal Aviation Administration (FAA) inspector and reported the following information. The purpose of the flight was for the flight instructor to demonstrate the airplane to the passenger. The passenger had recently obtained his flight instructor certificate with a single engine airplane rating and was interested in possibly obtaining his multiengine instructor rating in the accident airplane. The flight instructor stated that he arrived at the airport about 1800 and found the airplane parked in front of the office. He conducted a short preflight inspection using a checklist located in the airplane. In response to a specific question from the FAA inspector, the flight instructor reported that he opened each fuel tank and looked inside estimating 25 gallons of fuel in each of the two main fuel tanks. The passenger arrived about 2000, and they went into the office and reviewed paperwork related to renting the airplane. They then entered the airplane, with the flight instructor sitting in the left front seat and the passenger sitting in the right front seat.

The flight instructor reported that the taxi to runway 26L and the run-up checks were normal. During the takeoff roll, the airplane accelerated normally. Immediately after lifting off at 75 miles per hour, the left engine stopped running and the propeller stopped turning. When asked by the FAA inspector what procedures he used to address the engine failure, the flight instructor stated that he had all engine controls full forward and was using right aileron and left rudder to maintain directional control. He reported that he was unable to raise the landing gear as the hydraulic pump was mounted on the left engine. Since he could not raise the landing gear, he was unable to maintain airspeed and altitude. The airplane banked left and descended to ground impact.

The passenger was interviewed by a Federal Aviation Administration (FAA) inspector and reported the following information. He met the flight instructor at Blue Diamond's office about 2000. After reviewing some paperwork, they proceeded to the airplane. He asked the flight instructor if he had completed a pre-flight inspection of the airplane, to which the flight instructor replied in the affirmative. After they boarded the airplane, the flight instructor stated that he would be the pilot-in-command. The passenger reported that the flight instructor started the engines and proceeded to taxi to runway 26L. He noted that the flight instructor had difficulty maintaining the taxiway centerline, but he was not sure of the reason. He also noted that during the taxi, the controller notified the flight instructor that the airplane's navigation lights were not turned on, and it took the flight instructor several tries before he located the correct switch.

The passenger reported that before departure, the flight instructor did a magneto check only and performed no other checks. During the takeoff roll, the airplane "fishtailed" from right to left. The passenger yelled at the flight instructor to "Kill It" several times during the takeoff roll. The flight instructor continued the takeoff, lifting off at the red line airspeed [72 miles per hour]

on the airspeed indicator. According to the passenger, the flight instructor held the control wheel in the full left aileron position and was trying to make left rudder inputs. The passenger yelled at the flight instructor to add right rudder and at the same time, the flight instructor added left rudder trim. As the passenger was readjusting the rudder trim to the right, the airplane hit the ground.

Air traffic control personnel in the Brackett Field Air Traffic Control Tower observed the accident and reported that after takeoff, the airplane entered an "erratic left turn" and crashed into the side of a hill.

The crash site was about 0.7 miles on a 230-degree heading from Brackett Field. The area was an open grass covered field adjacent to a heavily populated RV park. Several persons from the park helped the flight instructor and passenger exit the airplane. Additionally, they used fire extinguishers to extinguish a fire that erupted in the area of the right engine.

PERSONNEL INFORMATION

The flight instructor, age 57, held a commercial pilot certificate with airplane single and multiengine land ratings and an instrument airplane rating. The commercial certificate had the limitation: airplane multiengine VFR only. He held a flight instructor certificate with airplane single and multiengine land ratings. The flight instructor's most recent first-class medical certificate was issued on February 12, 2007, with the limitation: holder shall possess glasses for near and intermediate vision. The flight instructor reported that he had accumulated 12,000 hours total flight time of which 5,000 hours were multiengine airplane flight time with 500 hours in the accident make and model airplane.

The passenger, age 28, held a commercial pilot certificate with airplane single and multiengine land ratings and an instrument airplane rating. He held a flight instructor certificate with an airplane single engine land rating. The passenger's most recent second-class medical certificate was issued on September 5, 2007, with no limitations. The passenger reported that he had accumulated 482 hours total flight time of which 31 hours were multiengine airplane flight time with zero hours in the accident make and model airplane.

AIRCRAFT INFORMATION

The twin-engine, low-wing airplane was manufactured in 1959. It was powered by two Lycoming O-320-B1A 160-horsepower engines equipped with two bladed Hartzell constant-speed propellers.

Logbook entries indicated the most recent annual inspection was completed on 02/09/07, at a total airframe time of 4,181 hours. The most recent 100-hour inspection was completed on 08/01/07, at a total airframe time of 4,367 hours. The right tachometer was removed during this inspection and a 0 time tachometer installed; the removed tachometer read 4,367 hours.

According to the engine logbooks, at the time of the most recent 100-hour inspection, the right engine had accumulated 590 hours since major overhaul (SMOH), and the left engine had accumulated 1,532 hours SMOH.

The time on the right and left tachometers at the accident site were 223.1 and 1,836.1 hours, respectively. The hour meter reading was 1045.0 hours.

Regarding engine failures, the owner's handbook for the airplane states, in part: If an engine failure occurs during the take-off run, the power on the good engine should be cut and the airplane stopped straight ahead. If it occurs after leaving the ground, but with sufficient landing area ahead, a landing should be effected immediately.

According to the performance charts in the owner's handbook, the takeoff distance for the airplane at a standard altitude of 1,000 feet and a temperature of 60 degrees Fahrenheit (16 degrees Celsius {C}) ranges from 400 feet at a gross weight of 2,900 pounds to 1,400 feet at a gross weight of 3,800 pounds.

METEOROLOGICAL INFORMATION

At 2047, Brackett Field reported wind from 200 degrees at 10 knots; 3,000 foot overcast; and 10 miles visibility. The altimeter was 29.97 inches of Mercury.

At 2053, Ontario International Airport, located about 10 nautical miles east of the accident site, reported wind from 250 degrees at 12 knots; visibility 8 miles; few clouds at 6,000 feet; temperature 13 degrees C; dew point 8 degrees C; and altimeter 29.93 inches of Mercury.

According to the U.S. Naval Observatory, sunset occurred in La Verne, California, at 1923, and the end of civil twilight was at 1949.

AIRPORT INFORMATION

Brackett Field Airport is owned by the county of Los Angeles and open to the public. The airport elevation is 1,011 feet. Runway 8R/26L is an asphalt runway, 4,839 feet long and 75 feet wide. It is equipped with medium intensity runway lights.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site and the airplane wreckage by a Safety Board investigator and representatives from the FAA, the engine manufacturer, and the airplane manufacturer revealed that the first indication of impact was some broken branches beneath a pine tree about 150 feet from the main wreckage. Red glass fragments of a color, shape, and size consistent with the left wing navigation light were found near the tree. Ground scars were also noted between the area of tree impact and the main wreckage. The impact line was about 210 degrees and the elevation of the main wreckage location was approximately 967 feet.

The nose section was crushed, the right wing was displaced upward and aft, and the left wing attach points were separated and the wing was rotated to an inverted position. There was thermal damage to the right engine accessories and nacelle area. All engine controls, including mixtures, throttles and propellers, were found in the full forward position. The landing gear was in the extended position. The left and right flap actuators were found in a position consistent with a flap setting of 10 to 12 degrees.

The airplane was equipped with four fuel tanks, two in each wing, a 36-gallon inboard main tank and an 18-gallon outboard aux tank. All of the fuel filler caps were the "Thermos" type expanding rubber plugs. The left outboard aux tank filler cap was found to be loose and could be removed by hand after expanding. No fuel was noted in the left aux tank. The left inboard main tank fuel cap was in place, secure and could not be removed without releasing. No fuel was noted in the left main tank.

The right aux tank filler cap was found to be loose and could be removed by hand after expanding. No fuel was noted in the right aux tank. The inboard fuel cap was in place, secure and also could be removed without releasing. About 10 gallons of fuel were removed from the right main tank prior to transport of the airplane.

The left fuel selector valve in the nacelle was positioned on the main tank, as were the controls in the cockpit. The firewall shut off valve, adjacent to the fuel filter in the nacelle, was about 1/2 travel toward the off position, possibly as a result of the cable being pulled during the impact sequence. The fuel filter was removed, no fuel was found but contaminates were noted in the bottom of the gascolator. However, the filter was not blocked.

The right fuel selector valve in the nacelle was positioned on the main tank, as were the controls in the cockpit. The firewall shut off valve, adjacent to the fuel filter in the nacelle, was in the open position. The fuel filter was removed; no fuel was found but contaminates were noted in the bottom of the gascolator. However, the filter was not blocked.

The left engine remained attached to the airframe by the engine mount. The engine sustained minor impact damage and came to rest inverted. Visual examination revealed no evidence of pre-impact catastrophic mechanical malfunction or fire. The crankshaft was free and rotated by hand in both directions. Thumb compression was noted on all cylinders. The valve train was observed to operate in proper order, and appeared to be free of any pre-impact mechanical anomalies. Mechanical continuity was noted throughout the rotating assembly, valve train and accessory section during hand rotation of the crankshaft. The combustion chambers of the cylinders were examined with a lighted borescope. No mechanical damage was noted, and there was no evidence of foreign object ingestion or detonation. The left and right magnetos were found securely clamped at the mounting pads. The magnetos were observed to produce spark at all four plug leads during hand rotation. There was no evidence of pre-impact mechanical anomalies noted during the examination of the left engine.

The left propeller remained secure to the engine and was used for rotation during the engine exam. The blades were marked L1 and L2 for identification. Blade L1 was secure in the hub and was bent aft about 15-20 degrees along the full span of the blade. There was some polishing, paint and leading edge erosion near the tip of the blade with nicks and chordwise surface scratches. Blade L2 was secure in the hub and was bent aft about 80 degrees near midspan. The blade displayed leading edge nicks and surface scratches near the tip of the blade.

The right engine remained attached to the airframe by the engine mount. The engine sustained minor impact damage. Visual examination of the engine revealed no evidence of pre-impact catastrophic mechanical malfunction or in-flight fire; however, thermal damage to the right engine accessories and nacelle area due to a small post impact fire was found. The crankshaft was found free and easy to rotate in both directions. Thumb compression was noted on all cylinders. The valve train was observed to operate in proper order, and appeared to be free of any pre-impact mechanical anomalies. Mechanical continuity was established throughout the rotating assembly, valve train and accessory section during hand rotation of the crankshaft. The combustion chambers of the cylinders were examined with a lighted borescope. No mechanical damage was noted, and there was no evidence of foreign object ingestion or detonation. The left and right magnetos were found securely clamped at their respective mounting pads. The magnetos incurred substantial thermal damage and could not be functionally tested. There was no evidence of pre-impact mechanical anomalies noted during the examination of the right engine.

The right propeller remained secure to the propeller flange, which was bent. The propeller was removed to facilitate rotation and examination of the engine. The blades were marked R1 and R2 for identification. Blade R1 was secure in the hub and was bent aft about 10-15 degrees along the outboard 1/3 of the span. The blade was twisted toward low pitch. The leading edge near the tip had nicks, dents, moderate erosion and chordwise scratches. Blade R2 was secure in the hub, bent aft about 30 degrees near midspan and was twisted toward low pitch. The leading edge had nicks, dents, and chordwise scratches, as well as paint erosion and polishing.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	57,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	February 12, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 14, 2007
Flight Time:	12000 hours (Total, all aircraft), 500 hours (Total, this make and model), 10000 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft)		

Co-pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	28,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	September 5, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 28, 2008
Flight Time:	482 hours (Total, all aircraft), 63 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4080P
Model/Series:	PA-23-160	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	23-1557
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 9, 2007 Annual	**Certified Max Gross Wt.:**	3800 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-B1A
Registered Owner:	On file	**Rated Power:**	160 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	POC,1011 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	20:47 Local	**Direction from Accident Site:**	50°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 3000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	La Verne, CA (POC)	**Type of Flight Plan Filed:**	None
Destination:	(POC)	**Type of Clearance:**	VFR
Departure Time:	20:40 Local	**Type of Airspace:**	

Airport Information

Airport:	Brackett Field POC	**Runway Surface Type:**	Asphalt
Airport Elevation:	1011 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26L	**IFR Approach:**	None
Runway Length/Width:	4839 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	34.089168,-117.796943

Administrative Information

Investigator In Charge (IIC):	Struhsaker, Georgia
Additional Participating Persons:	Ronald R Brant; Federal Aviation Administration; Los Angeles, CA Mark W Platt; Lycoming Engines; Williamsport, PA Michael McClure; Piper Aircraft, Inc.; Vero Beach, FL
Original Publish Date:	May 6, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=67827