Aviation Investigation Final Report

Location:	Echo Summit, California	**Accident Number:**	LAX02FA255
Date & Time:	August 19, 2002, 10:35 Local	**Registration:**	N7794C
Aircraft:	Piper PA-28R-200	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The 850-hour instrument rated private pilot contacted ground control requesting taxi instructions for departure. The pilot was cleared to taxi to runway 18 and was notified the wind was from 180 degrees at 13 knots, altimeter 30.06 inches, and told to check density altitude. After completing a run-up, the pilot, who was reported to be very familiar with the airport and the route of flight, contacted the tower and requested a straight-out departure over Echo Summit. No distress calls were received from the airplane. The wreckage of the airplane was located in a wooded area approximately 7.2 miles south of the airport at an approximate altitude of 7,432 feet msl, after a post-impact fire sparked a 400-acre forest fire. The airplane impacted trees and the rocky terrain with the wing flaps retracted and the landing gear extended. The wreckage came to rest on a measured heading of 116 degrees magnetic. The density altitude at the accident site was calculated at 8,551 feet. The airplane was found to be 488 pounds below its maximum takeoff weight of 2,650 pounds at the time of departure. No discrepancies or mechanical anomalies were found with the wreckage at the accident site. Flight control continuity was established to all of the flight control surfaces. No mechanical anomalies were noted with the engine during a detailed teardown examination.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to continue the flight into the rising mountainous terrain, and subsequent failure to maintain clearance with the trees. Contributing factors were the rising mountainous terrain, and the high density altitude,

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings
1. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. (F) TERRAIN CONDITION - RISING
3. OBJECT - TREE(S)
4. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
5. (F) AIRCRAFT PERFORMANCE - EXCEEDED
6. IN-FLIGHT PLANNING/DECISION - POOR - PILOT IN COMMAND
7. CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On August 19, 2002, at 1025 pacific daylight time, a Piper PA-28R-200 single-engine airplane, N7794C, was destroyed upon collision with trees and terrain while maneuvering near Echo Summit, California. The instrument rated private pilot and his passenger were fatally injured. The airplane was registered to and operated by the pilot. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight originated from the South Lake Tahoe Airport (TVL) at 1030, and was destined for the Buchanan Field Airport, near Concord, California.

The pilot of N7794C contacted ground control at 1025:55 requesting taxi instructions for departure. The pilot was cleared to taxi to runway 18 and was notified the wind was form 180 degrees at 13 knots, altimeter 30.06 inches, and told to check density altitude. After completing a run-up, the pilot contacted the tower and requested a straight out departure over Echo Summit. No distress calls were received from the airplane.

The wreckage of the airplane was located after a post-impact fire sparked a 400-acre forest fire, known as the "Showers Fire" which continued to burn for 4-5 days following the aircraft accident.

The airplane was estimated to have 38 gallons of fuel on board at the time of departure from TVY. According to the pilot's brother, the airplane was topped off with fuel prior to the flight from Concord to South Lake Tahoe. The brother also reported that he estimated that the total weight of the overnight baggage carried on the airplane amounted to approximately 20 to 25 pounds.

The aircraft was tied down at the Oasis Aviation ramp for the two-night overnight stay at the South Lake Tahoe Airport. No fuel purchases were made at TVL.

PERSONEL INFORMATION

The pilot held a private pilot certificate with an airplane single-engine land rating. The pilot was issued an instrument rating on January 2, 1998. The pilot was issued a second-class medical certificate on April 1, 1998, and reported on the medical application form that he had accumulated a total of 850 hours of flight.

The pilot's logbooks were not located during the course of the investigation.

A family representative of the pilot stated that the pilot's family owned a cabin in the Lake

Tahoe area and the pilot had made several flights to and from TVL and he "was very familiar with the airport, the route of flight and the area in general."

AIRCRAFT INFORMATION

The 1976 model Piper Arrow II, serial number 28R-7635117, was a low wing semi-monocoque airplane. The airplane was powered by a direct drive, horizontally opposed fuel injected Lycoming IO-360-CIC engine, rated at 200 horsepower. The airplane was configured to carry a maximum of four occupants. The airplane was equipped with a constant speed, controllable pitch propeller and featured two metal wing tanks with a combined total capacity 50 gallons, of which 48 were usable.

The aircraft maintenance logbooks were not located during the course of the investigation.

METEOROLOGICAL INFORMATION

The nearest weather observation facility was TVL, located approximately 7.2 miles north of the accident site. At 1053, TVL was reporting wind from 200 degrees at 13 knots, gusting to 19 knots, sky condition clear, temperature 73 degrees Fahrenheit, dew point 19 degrees Fahrenheit, and an altimeter setting of 30.06 inches of Mercury.

Using a field elevation of 6,260 feet msl, the investigator-in-charge calculated the pressure altitude at 6,132 feet and the density altitude at 8,551 feet at the airport, at the time of the accident.

AERODROM INFORMATION

TVL is surrounded on the south, east, and west sides by rapidly rising terrain (Sierra Nevada mountain range) at an elevation of 6,264 feel msl. The Sierra Nevada mountain range features the highest mountain in the continental United States (Mount Whitney), which is approximately 180 miles south of the accident site. Terrain to the north of the airport is flat and unobstructed for approximately 29 miles, with Lake Tahoe providing a good area to gain altitude without circling.

TVL features a single asphalt 8,544 feet long by 150 feet wide runway aligned on a north-south direction (18-36). The preferred arrival runway is runway 18, and the preferred departure runway is runway 36. A right downwind departure is recommended for runway 18. A golf course is located within a mile of the departure end of runway 18 also allows sufficient space for low performance aircraft to climb. The local procedure utilized by local pilots is to gain altitude while circling the golf course. Another utilized procedure is to request a downwind departure and climb northbound towards the lake.

WRECKAGE AND IMPACT INFORMATION

The accident investigation team was not able to reach the accident site until August 21, 2002, due to high winds and the forest fires in the area. The main wreckage was located in a wooded area approximately 7.2 miles south (173 degrees) of TVY at an approximate altitude of 7,432 feet msl. The Global Positioning System (GPS) coordinates recorded at the accident site using a hand held GPS unit were 38 degrees 46.596 north latitude, and 120 degrees 01.608 west longitude. The airplane came to rest invested on a measured heading of 116 degrees, where post impact fire consumed the aircraft.

Examination of the accident site revealed branches and portions of tops of several pine trees, along with paint chips and small portions of the aircraft were found approximately 264 feet from the main wreckage. One matured pine tree, truck circumference measured at 122-inches was downed by the aircraft. Pieces of fiberglass, identified as portions of the engine cowling were found imbedded in the truck of the tree, adjacent to a large indention made by the frontal area of the engine.

The main wreckage consisted of the engine, the propeller, the remains of the right wing assembly, the right horizontal stabilizer, the top of the engine cowling, the engine muffler, and the seat frames. With the exception of the wing tip for the left wing and a portion of the left aileron, all other airframe components were found within a 30-foot radius of the resting place of the main wreckage.

No evidence of a pre-impact fire or smoke was found on the pieces of Plexiglas or portions of the cabin furnishings found along the wreckage path that were not subject to fire.

Flight control continuity was established to all flight control surfaces.

The left wing was severely fire damaged. The left main landing gear was found in the retracted position. The inboard portion of the flap assembly for the right wing was the only portion of flap that was not consumed by fire. Based on the debris pattern and fire patterns exhibited, the flaps appeared to be in the retracted (up) position. The right main landing gear was found in the extended position.

The fuselage was completely fire damaged. The nose landing gear was found in the retracted position. All communications and navigational equipment were destroyed by fire. The tachometer was found reading 1,500 rpm, and the airspeed indicator indicated 50 miles per hour. The clock displayed a time of 1417, and the suction gauge, was found reading less than zero. Both ears from the pilot's yoke were found separated. The flap handle in the cockpit was destroyed by fire. The fuel selector was not located at the accident site. One seat belt buckle was found in the latched position.

The airplane manufacturer's data plate was located in the tail of the aircraft and confirmed the identification of the aircraft. Measuring the stabilizer jackscrew revealed that the airplane was trimmed in a seven-degree nose up (tab-down) attitude at the time of impact.

The propeller spinner was separated from the propeller assembly. The spinner was crushed and did not reveal any rotational damage. The propeller remained attached to the engine crankshaft flange. Both propeller blades remained attached to the propeller hub. Both propellers were found to be loose on their mounts. Both propeller blades were found in a position similar to the feathered position. One propeller blade was undamaged and did not have any leading edge damage was noted. The second propeller blade did not have any leading edge damage. The blade featured a bend at an approximate 75-degree angle at a point 12 inches from the tip of the blade. The bend on the propeller blade followed the contour of the rock it came to rest by.

The alternator was separated from the engine. The engine starter also separated from its mounts but remained attached to the engine by an electrical cable. Both magnetos were separated from the engine and found severely fire damaged. The vacuum pump was found separated from the engine. The throttle was found in the closed or idle position. The mixture lever was found in the full rich position.

The engine remained attached to the engine mounts. The oil pan was burned-off the engine. The engine sustained severe impact damage. A crack was found on the engine case from the #1 to the #2 cylinder. The oil dipstick assembly was found separated from the engine. The oil cap was still fastened to the tube.

MEDICAL AND PATHOLOGICAL INFORMATION

Toxicological tests were performed by the Federal Aviation Administration's Civil Aeromedical Institute (CAMI) were negative for carbon monoxide, drugs, and alcohol. An autopsy could not be performed due to the condition of the body.

TESTS AND RESEARCH

Weight and balance calculations were made by using data from provided by Federal Aviation Administration medical records and input from family members. Using an average basic weight, the airplane was estimated to be approximately 488 pounds below the airplane's maximum takeoff gross weight of 2,650 pounds.

A detailed examination of the engine was conducted on March 11, 2003, at the facilities of Lycoming, near Williamsport, Pennsylvania, under the supervision of an NTSB investigator. The spark plug electrodes remained mechanically undamaged, and according to the Champion Aviation Check-A-Plug chart (AV-27), the spark plug electrodes displayed wear consistent with normal operation. The fuel servo sustained fire and heat damage. The fuel flow divider diaphragm sustained fire and heat damage. The fuel servo inlet screen contained light debris. Internal timing was observed to be correct at the rear accessory gears.

The cylinder combustion chambers were found to be consistent with normal operation. The pistons, piston rings, and cylinder walls were noted to be free of anomalies. The main bearing

journals sustained fire and heat damage. No anomalies were noted on the connecting rod bearing journals, crankshaft gear and associated parts. The number one, two, three, and four connecting rods, bolts, nuts, and caps, appeared to be free off anomalies and were fire damaged. The crankshaft intake and exhaust lobes were observed in a normal condition with evidence of fire and heat damage.

ADDITIONAL INFORMATION

The wreckage was released to the owner's representative upon completion of the investigation.

Pilot Information

Certificate:	Private	**Age:**	52,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:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	April 1, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	850 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7794C
Model/Series:	PA-28R-200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28R-7635117
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	2650 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-CIC
Registered Owner:	On file	**Rated Power:**	200 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	TVL,6264 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	353°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots / 19 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	23°C / -7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	So. Lake Tahoe, CA (TVL)	**Type of Flight Plan Filed:**	None
Destination:	Concord, CA (CCR)	**Type of Clearance:**	None
Departure Time:	10:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	LAKE TAHOE TVL	**Runway Surface Type:**	Asphalt
Airport Elevation:	6264 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	8544 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	38.783054,-120.033058

Administrative Information

Investigator In Charge (IIC):	Casanova, Hector
Additional Participating Persons:	Hugh J Roche, JR; FAA Flight Stanrds District Office; Reno, NV Paul Lehman; Piper Aircraft; Vero Beach, FL
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55521