



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Girdwood, AK	<b>Accident Number:</b>	ANC19FA042
<b>Date &amp; Time:</b>	08/04/2019, 1627 AKD	<b>Registration:</b>	N7402D
<b>Aircraft:</b>	Piper PA22-150	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Controlled flight into terr/obj (CFIT)	<b>Injuries:</b>	4 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The airline transport pilot was conducting a local flight with three passengers over an area that comprised remote, mountainous terrain. One witness saw the airplane performing aggressive maneuvers earlier in the flight, and observed the airplane approached a ridge, its nose pitched up and the airplane entered a steep climb before disappearing from view. Multiple witnesses saw the airplane flying parallel to a mountain ridge before it entered a turn and began a descent. The airplane then disappeared from view followed by a plume of black smoke. None of the witnesses reported hearing any unusual sounds from the accident airplane before the accident.

Toxicological testing of the pilot detected 0.226 gm/dl ethanol in the femoral blood, which is greater than 5.5 times the regulatory limit for pilots. The concentration of ethanol in the pilot's vitreous fluid compared to femoral blood was consistent with the recent ingestion of alcohol. It is likely that at these levels the pilot experienced not only degradation of judgment, but mood and behavioral changes, altered perception of the environment, and deficits in coordination, psychomotor skills, and attention.

Although the airplane was not recovered from the accident site and could not be examined, the circumstances of the accident are consistent with the pilot's failure to maintain clearance from terrain while maneuvering due to the impairing effects of his recent alcohol consumption.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to maintain clearance from terrain due to his impairment from alcohol consumption.

## Findings

Personnel issues

Alcohol - Pilot (Cause)

## Factual Information

### History of Flight

#### Maneuvering

Controlled flight into terr/obj (CFIT) (Defining event)

On August 4, 2019, about 1627 Alaska daylight time, a Piper PA22-150 airplane, N7402D, was destroyed by impact and a postcrash fire when it collided with terrain about 5 miles north of Girdwood Airport (AQY), Girdwood, Alaska. The airline transport pilot (ATP), and three passengers were fatally injured. The airplane was privately owned by one of the passengers and was operated by the ATP pilot as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight. Visual meteorological conditions prevailed in the area, and no flight plan was filed for the local flight, which departed AQY about 1615.

A friend of the airplane owner stated that he and the owner had been conversing via text message on the day of the accident. The owner, who held a student pilot certificate, indicated that he and the pilot had been drinking alcoholic beverages, but stated that he would not be flying the airplane and would be a passenger on the accident flight. The purpose of the flight was to take the passengers on a short 15-20-minute sightseeing flight of the Girdwood area, which consists of remote, steep, mountainous terrain, ranging from sea level to about 7,000 ft, which is part of the Chugach Mountain Range.

Multiple witnesses observed the airplane flying parallel to a mountain ridge before it entered a turn to the north and began a descent. The airplane then disappeared from view, and then they saw a plume of black smoke. One witness saw the airplane performing aggressive maneuvers earlier in the flight, and observed the airplane approach a mountain ridge, its nose pitched up and the airplane entered a steep climb before disappearing from view. No witnesses reported hearing any unusual sounds from the accident airplane.

## Pilot Information

<b>Certificate:</b>	Airline Transport; Commercial	<b>Age:</b>	31, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane; Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Helicopter; Instrument Airplane; Instrument Helicopter	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	02/26/2019
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 2700 hours (Total, all aircraft)		

The pilot, age 31, held an airline transport pilot certificate with a rotorcraft-helicopter rating. Additionally, he held commercial pilot privileges for airplane single and multi-engine land and instrument airplane. He also held a flight instructor certificate with airplane single-engine, airplane multi-engine, rotorcraft-helicopter, instrument airplane, and instrument helicopter ratings. His most recent Federal Aviation Administration (FAA) second-class medical certificate was issued on February 26, 2019, with the limitation that he must wear corrective lenses. On the application for that medical certificate, he reported 2,700 hours total flight experience, of which 40 hours were in the previous 6 months.

Some personal flight records were located for the pilot; however, they were not complete.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N7402D
<b>Model/Series:</b>	PA22-150	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1957	<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	22-5163
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	09/17/2018, Annual	<b>Certified Max Gross Wt.:</b>	2000 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	3175 Hours as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C126 installed	<b>Engine Model/Series:</b>	O-320 SERIES
<b>Registered Owner:</b>	Erickson Karl F	<b>Rated Power:</b>	150 hp
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The airplane was manufactured in 1957 and was equipped with a Lycoming O-320 A1A engine rated at 150 horsepower. Review of the maintenance records revealed that the most recent annual inspection of the airframe and engine was completed on September 17, 2018, when the airframe had accumulated 3,175 hours total time in service and the engine had accumulated 1,336 hours since overhaul.

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:	0053 UTC	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	Overcast / 6000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	7 knots / 15 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	80°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.14 inches Hg	Temperature/Dew Point:	21° C / 14° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Girdwood, AK	Type of Flight Plan Filed:	None
Destination:	Girdwood, AK	Type of Clearance:	None
Departure Time:	AKD	Type of Airspace:	Class G

The closest official weather observation station to the accident site was Portage Glacier, Whittier, Alaska, located about 22 miles southeast. The 1653 observation included wind from 080° at 7 knots, gusting to 15 knots; 10 statute miles visibility; overcast clouds at 6,000 ft above ground level; temperature 70°F; dew point 57°F; and an altimeter setting of 30.14 inches of mercury.

## Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	2 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	On-Ground
Total Injuries:	4 Fatal	Latitude, Longitude:	61.036944, -149.045278

The remote accident site was located on the south face of Goat Mountain in steep, mountainous terrain. The airplane impacted the terrain about 15 ft below the top of a rock-faced ridgeline at an altitude of about 5,512 ft mean sea level (msl) and came to rest inverted on a narrow rock shelf at an altitude of about 5,437 ft msl. The wreckage was largely consumed by postcrash fire; small fragments of wreckage were located on the opposite side of the ridge.

The airplane was not recovered and could not be examined. Review of photographs provided by the Alaska Mountain Rescue Group and the Alaska State Troopers revealed that the left and right wings and their respective control surfaces were destroyed by fire, with only portions of

the wing spars remaining. The cockpit, fuselage, and empennage exhibited extensive thermal damage and control continuity could not be verified.

The engine exhibited extensive impact and thermal damage. The propeller separated from the engine crankshaft. One propeller blade exhibited torsional "S" twisting and aft bending about 12 inches from the tip. The other propeller blade exhibited significant torsional "S" twisting and buckling on the trailing edge of the blade.

## Medical And Pathological Information

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### Pilot

An autopsy of the pilot was performed by the Alaska State Medical Examiner, Anchorage, Alaska. The cause of death was attributed to multiple blunt (deceleration type) injuries.

Postmortem toxicological testing by the Alaska State Medical Examiner of the pilot's femoral blood was positive for ethanol at 0.226 grams per deciliter (gm/dl). Toxicology testing performed at the FAA Forensic Sciences Laboratory detected ethanol in cavity blood at 0.252 gm/dl and in vitreous fluid at 0.238 gm/dl; methanol in an amount too low to quantify was detected in cavity blood and vitreous fluid.

### Student Pilot/Passenger

Toxicology testing of the student pilot/passenger performed at the FAA Forensic Sciences Laboratory detected ethanol in vitreous fluid at 0.058 gm/dl and in brain and muscle at 0.055 and 0.038 grams per hectogram, respectively.

### Ethanol

Ethanol is a social drug commonly consumed by drinking beer, wine, or liquor. Ethanol acts as a central nervous system depressant; it impairs judgment, psychomotor functioning, and vigilance. Effects of ethanol on aviators are generally well understood; it significantly impairs pilot performance, even at very low levels. Title 14 *CFR* 91.17(a) prohibits any person from acting or attempting to act as a crewmember of a civil aircraft while having 0.040 gm/dl or more ethanol in the blood.

Ethanol is water soluble, and after absorption it quickly and uniformly distributes throughout the body's tissues and fluids. The distribution pattern parallels water content and blood supply of the tissue. A small amount of ethanol can be produced after death by microbial activity, usually in conjunction with other alcohols such as methanol; vitreous humor does not suffer from such production. Postabsorption, vitreous humor has about 12% more ethanol than blood.

While the acute effects of ethanol can vary depending on an individual's frequency of use, body weight, and tolerance, in general, at blood ethanol concentrations as low as 0.02 gm/dl there is relaxation and some loss of judgment; at 0.05 gm/dl, there is further degradation of judgment, psychomotor functioning, and alertness. At blood ethanol concentrations above 0.10 gm/dL, there is prolonged reaction time, altered perception of the environment, lack of coordination, slowed thinking, and mood and behavioral changes. Above 0.15 gm/dl, individuals may have significant loss of muscle control and major loss of balance. In addition to worsening motor coordination and disorientation, at concentrations above 0.20 gm/dl, individuals may experience amnesia or blackouts and double vision.

A copy of the National Transportation Safety Board's medical officer's factual report is available in the public docket for this accident.

### **Additional Information**

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The airplane's weight and balance at the time of the accident was estimated based on the pilot's weight from his most current FAA medical examination (180 lbs) and the weights of the passengers taken from government records (200 lbs for the front seat passenger and 300 lbs combined for the rear seat passengers).

A friend of the airplane owner reported that the airplane was fueled about a week and a half before the accident and had not been flown since that time. Accounting for the fuel burned during the accident flight, the estimated fuel onboard at the time of the accident was 34 gallons (204 lbs). The oil onboard weighed about 15 lbs.

The last documented weight and balance information located for the airplane was dated November 1, 2014. At that time, the basic empty weight of the airplane on wheels was 1,149.3 lbs with a center of gravity of 13.43 inches.

Using the values listed above, the gross weight of the airplane at the time of the accident was about 2,048.3 lbs, which was 48.3 lbs over the airplane's approved maximum takeoff gross weight of 2,000 lbs. The estimated center of gravity at the time of the accident was 20.79 inches. The center of gravity range at 2,000 lbs (maximum gross weight) was 17.5 inches to 23.0 inches.

## Administrative Information

**Investigator In Charge (IIC):** David B Banning **Report Date:** 04/08/2020

**Additional Participating Persons:** Shawn Toth; Federal Aviation Administration; Anchorage, AK

**Publish Date:** 04/08/2020

**Note:** The NTSB traveled to the scene of this accident.

**Investigation Docket:** <http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=99998>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).