



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Eden Prairie, MN	<b>Accident Number:</b>	CEN18FA003
<b>Date &amp; Time:</b>	10/04/2017, 1108 CDT	<b>Registration:</b>	N428AP
<b>Aircraft:</b>	SCHAFFER Fisher Horizon 2	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The private pilot built the airplane over a 24-year period; the accident occurred on the airplane's first flight after the pilot completed building it. The pilot aborted the first takeoff attempt for unknown reasons. During the second takeoff, the airplane was struggling to gain altitude, pitching up and down, and banking. Several witnesses reported hearing "good" engine sounds. Just before the impact, the airplane was in a steep nose-down, left descending spiral before it descended below the trees, followed by a plume of black smoke.

The airplane's wooden structure was mostly destroyed by impact forces and postimpact fire. Portions of the flight control systems were found in the wreckage; however, it could not be determined if they were installed and rigged properly due to the amount of damage. Witnesses reported hearing the engine operating, and postaccident engine examination did not reveal evidence of any mechanical malfunctions or failures that would have precluded normal operation. Therefore, it is unlikely that the airplane experienced a loss of engine power.

The pilot did not have any flight experience in the accident make and model airplane. Further, he had only flown for 4.8 hours in the 12 months before the accident flight. Although it is likely that the pilot's lack of recent flight experience and time in the airplane's make and model played a role in the accident, investigators were unable to determine the cause of the accident due to thermal damage to the airplanes flight controls.

## Probable Cause and Findings

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

An inflight loss of control and collision with terrain for undetermined reasons after a thorough examination of the airplane's flight controls was unable to confirm control continuity.

Contributing to the accident was the pilot's lack of experience in the accident make and model airplane and his lack of recent flight experience.

## Findings

<b>Aircraft</b>	Performance/control parameters - Not attained/maintained (Cause)
<b>Personnel issues</b>	Aircraft control - Pilot (Cause) Total experience w/ equipment - Pilot (Factor) Recent experience - Pilot (Factor)
<b>Not determined</b>	Not determined - Unknown/Not determined (Cause)

## Factual Information

### HISTORY OF FLIGHT

On October 4, 2017, about 1107 central daylight time, an amateur-built Horizon 2 airplane, N428AP, collided with terrain in Eden Prairie, Minnesota. The private pilot was fatally injured, and the airplane was destroyed by impact forces and postimpact fire. The airplane was registered to the pilot who was operating it under the provisions of Title 14 Code of Federal Regulations Part 91. Visual flight rules conditions existed near the accident site at the time of the accident, and a flight plan had not been filed for the local personal flight, which departed from Flying Cloud Airport (FCM), Eden Prairie, Minnesota, about 1103.

The pilot was conducting the first flight in his Horizon 2 airplane since building it. According to the FCM tower controller, after the airplane lifted off from runway 28R, the pilot aborted the takeoff for unknown reasons. The pilot taxied the airplane back to the end of the runway and then took off again.

One witness at the airport reported that the airplane was "unstable" during the takeoff. Another witness reported that it appeared as if the airplane "became airborne too soon as the airplane settled back on the runway" before lifting off again. Witnesses also described the airplane struggling to gain altitude, pitching up and down, and banking during the takeoff. One witness stated that he could see the top of the wings, as if the airplane was straight up and down, before it turned to the southeast. Several witnesses reported hearing "good" engine sounds. Other witnesses, who saw the airplane just before the impact, reported that it was in a steep nose-down, left descending spiral. Two witnesses reported seeing the airplane spiral one and a half to three times before it descended below the trees, followed by a plume of black smoke.

The Minneapolis St. Paul Metropolitan Airport Commission provided flight track data for the accident flight. The data indicated that the airplane departed from runway 28R and made a wide, climbing right turn to the northeast. During the climb, the airplane leveled off for about 10 seconds about 925 ft above ground level (agl). The climb then continued to 1,050 agl, at which point the airplane entered a descent and was then lost on radar.

### PERSONNEL INFORMATION

The pilot held a private pilot certificate with a single-engine land rating, which was issued on October 12, 1988. The pilot's logbook contained entries from May 31, 1987, through August 27, 2016. Between 1999 and 2005, the pilot recorded 10.2 hours of flight experience. There were no entries between 2005 and August 6, 2016. The pilot recorded 4.8 hours of flight experience with a flight instructor in a Jabiru airplane between August 6 and August 27, 2016, at which time, the pilot completed a flight review. According to the logbook, the pilot's total flight experience was 312.1 hours. The pilot did not log any flight time in a Horizon 2 airplane, and the logbook did not contain a tailwheel endorsement. The pilot's most recent Federal Aviation Administration (FAA) medical certificate was issued on March 7, 2012.

The flight instructor, who had flown with the pilot in August (about 2 months before the accident), stated that they had discussed whether to have an experienced pilot conduct the first flight in the pilot's airplane after it was built. The flight instructor stated that the pilot replied that he had built the airplane, so he was going to conduct the first flight.

#### AIRCRAFT INFORMATION

The Horizon 2 is a two-place, high-wing, tailwheel-equipped airplane with a tandem seating arrangement. The airplane structure was made of primarily wood and had a fabric skin. The airplane was powered by a 100-horsepower, 4-stroke, liquid-cooled, Subaru EA81 engine. The engine logbook indicated that the engine was rebuilt in March 2015. The only other entry in the logbook was dated May 5, 2017, which indicated that an oil cooler had been installed. There were no engine times listed in the logbook.

The pilot maintained a build log for the airplane, which indicated that he had purchased the plans and started building the airplane in 1991. The last entry in the log was dated June 16, 2015, which documented adjustments to the carburetor and throttle control cable.

On June 7, 2017, the pilot ground looped the airplane, which resulted in landing gear damage, while performing high-speed taxi tests.

#### AIRPORT

#### WRECKAGE AND IMPACT INFORMATION

The initial impact point was in a parking lot and left scrape marks on the asphalt. The wreckage path from the initial impact point to the main wreckage was on a magnetic heading of 30°. A gouge mark was found in the asphalt about 20 ft farther along the path, and it contained numerous pieces of splintered wood. The right wing was found wrapped around a pole about 210 ft from the initial impact. Further along the wreckage path were the fuel tanks, the engine, portions of the cockpit/fuselage, the empennage, and the propeller hub. The wreckage from the right wing to the end of the wreckage path was mostly destroyed by fire. Pieces of the splintered composite propeller blade, plexiglass, and wood were scattered along the entire wreckage path.

The fuselage and cockpit area were destroyed by fire. The main landing gear assembly was separated from the fuselage. The bottom of the right wing was destroyed from the wing root to the aileron attachment point. The fabric on the top of the wing was scorched and melted in the wing root area. The flap was separated into two pieces. The inboard section of the flap was separated from the wing, and the outboard section remained attached. The aileron remained intact and attached to the wing. The control cables were pulled out from the wing and remained attached to the cockpit control column.

The left wing was destroyed by fire. The left aileron was separated from the wing. The aileron control cable was found near the burned wing, and it remained attached to the cockpit control column.

The fuel tanks were separated from the wings and burned. The fuel tank caps were not in place; however, melted material was visible around the base of the filler neck. Material was visible inside the left fuel tank, and it appeared to be portions of the melted fuel cap. The position of the cockpit fuel selector could not be determined due to impact and fire damage.

The empennage frame was heat damaged but remained intact. A portion of scorched fabric remained attached to the right elevator. The rudder cables remained attached to the bottom of the rudder and tailwheel. Cable continuity from the cockpit area to the forward and aft seat right rudder pedals was established. The forward and aft seat left rudder pedals were not found. However, the left cable was intact, and it contained the turnbuckles and rudder pedal attachment hardware.

The elevator control push-pull tube was connected at the elevator control surface and at the cockpit control. The center section of the push-pull tube was melted, and only portions of the tube were found. The elevator trim cable remained attached at the elevator control surface.

The engine was burned, and its right side was impact-damaged. The right valve cover was impact-damaged and was separated from the engine. Two of the valve lifters on the right side were separated from the engine. The left valve cover was in place, and the valves and springs were intact. The oil pan was removed from the engine, and the inside of the engine was intact and contained oil. The propeller was separated from the engine. The ring gear was smashed rearward against the engine case.

One of the propeller's composite blades remained mostly intact and attached to the hub. The butt end of the other two blades remained attached to the hub. The propeller spinner was separated from the hub. The spinner was flattened and exhibited a small amount of torsional bending.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Hennepin County Medical Examiner's Office, Minneapolis, Minnesota, conducted an autopsy of the pilot. The pilot's death was attributed to "multiple blunt force injuries due to an airplane crash."

The FAA's Bioaeronautical Research Sciences Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The testing was negative for carbon monoxide, cyanide, ethanol, and drugs.

## History of Flight

Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	77, Male
<b>Airplane Rating(s):</b>	Single-engine Land	<b>Seat Occupied:</b>	Unknown
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	None None	<b>Last FAA Medical Exam:</b>	03/07/2012
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	08/27/2016
<b>Flight Time:</b>	312.1 hours (Total, all aircraft), 0.1 hours (Total, this make and model), 205.9 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	SCHAFFER	<b>Registration:</b>	N428AP
<b>Model/Series:</b>	Fisher Horizon 2	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2016	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	001
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	Unknown	<b>Certified Max Gross Wt.:</b>	1050 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Subaru
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	EA81
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	100
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	FCM, 906 ft msl	Distance from Accident Site:	225 Nautical Miles
Observation Time:	1605 UTC	Direction from Accident Site:	328°
Lowest Cloud Condition:		Visibility	10 Miles
Lowest Ceiling:	Broken / 2400 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.37 inches Hg	Temperature/Dew Point:	11° C / 5° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Eden Prairie, MN (FCM)	Type of Flight Plan Filed:	None
Destination:	Eden Prairie, MN (FCM)	Type of Clearance:	VFR
Departure Time:	1103 CDT	Type of Airspace:	Class D

## Airport Information

Airport:	Flying Cloud (FCM)	Runway Surface Type:	Asphalt
Airport Elevation:	906 ft	Runway Surface Condition:	Dry
Runway Used:	28R	IFR Approach:	None
Runway Length/Width:	3898 ft / 75 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	44.855833, -93.483889 (est)

## Administrative Information

Investigator In Charge (IIC):	Pamela S Sullivan	Report Date:	07/08/2019
Additional Participating Persons:	Allan Thilmany; FAA; Minneapolis, MN		
Publish Date:	07/08/2019		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=96144">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=96144</a>		

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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](#).