



Aviation Investigation Final Report

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|--------------------------------|--------------------------------------|-------------------------|-------------|
| Location: | Albany, Oregon | Accident Number: | WPR21FA265 |
| Date & Time: | July 9, 2021, 20:51 Local | Registration: | UNREG |
| Aircraft: | North Wing Mustang | Aircraft Damage: | Substantial |
| Defining Event: | Loss of control in flight | Injuries: | 2 Fatal |
| Flight Conducted Under: | Part 91: General aviation - Personal | | |

Analysis

After departure, the pilot of the weight-shift-control trike flew for about 3.3 miles. When the trike was at an altitude of about 230 ft above the ground, it banked to the left in an almost 90° turn. The left wing continued to drop down, and the aircraft descended toward the ground as the turn tightened. The aircraft impacted the ground in a nose-low attitude.

Postaccident examination of the aircraft, including the flight controls, structure, and engine, revealed no evidence of any mechanical anomalies. The engine speed was within its normal range while the aircraft was banked. According to the manufacturer, the aircraft's limitations included not exceeding bank angles of 60° and pitch angles of 30°. The manufacturer's manual stated that flying the aircraft with a bank angle exceeding 60° "should never be attempted under any circumstance." The pilot flew the aircraft in a manner that was not consistent with the manufacturer's guidance and lost control of the aircraft during the low-level left turn due to the excessive bank angle.

Probable Cause and Findings

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

The noncertificated pilot's loss of aircraft control after a low-level turn with a bank angle that exceeded the manufacturer's operating limitations.

Findings

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|-------------------------|--|
| Aircraft | Lateral/bank control - Not attained/maintained |
| Personnel issues | Qualification/certification - Pilot |

Factual Information

History of Flight

Maneuvering-low-alt flying Loss of control in flight (Defining event)

On July 9, 2021, about 2051 Pacific daylight time, an experimental amateur-built North Wing Mustang 3 weight-shift-control trike, which was not registered, was substantially damaged when it was involved in an accident near Millersburg, Oregon. The noncertificated pilot and passenger were fatally injured. The aircraft was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to family members, the pilot and passenger departed from the pilot's home airport in Albany, Oregon. After overflying the pilot's home, located about 4,000 ft north of the airport, the aircraft continued northeast for about 3.3 miles. The aircraft then turned left and flew close to the passenger's home before impacting the ground (see figure 1).

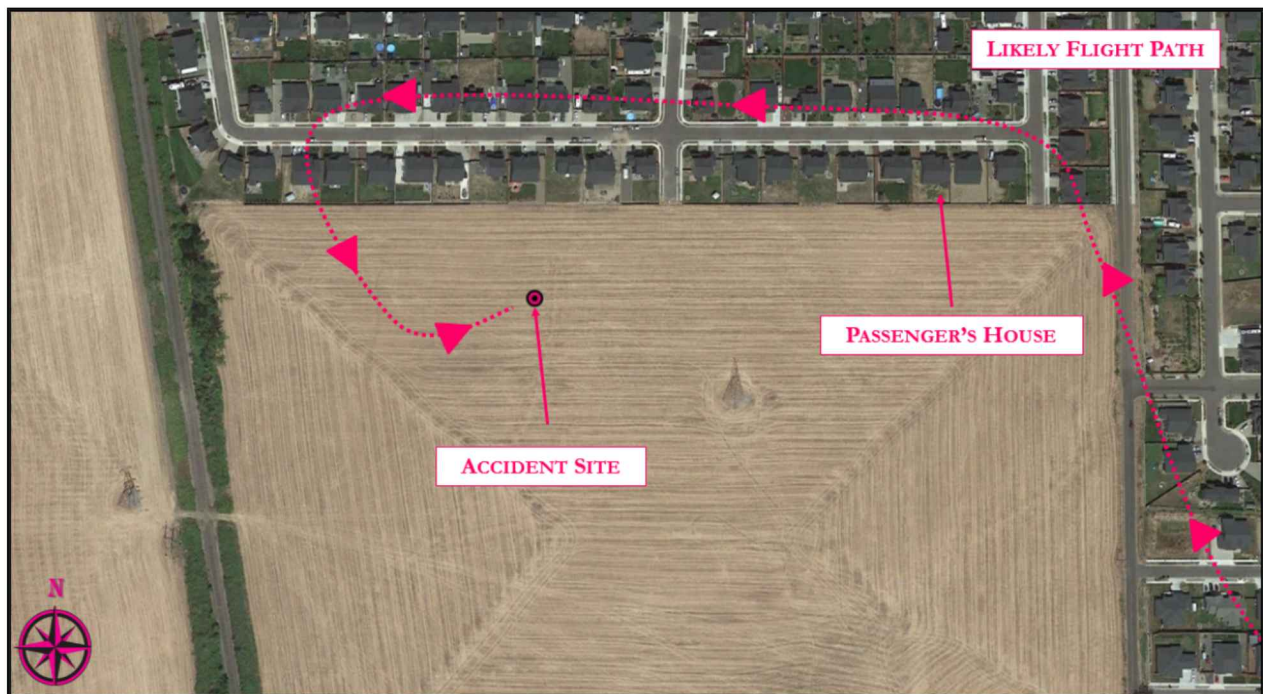


Figure 1. Likely flightpath impact

Several witnesses on the ground recorded the airplane's maneuvers on their mobile phone devices. A review of those videos showed that the aircraft banked to the left in an almost 90° turn. The left wing continued to drop downward, and the aircraft descended toward the ground as the turn tightened. The aircraft impacted terrain in a left-wing-low attitude (see figure 2).



Figure 2. Excerpts from a mobile phone video.

Pilot Information

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|----------------------------------|-------------|--|------------------|
| Certificate: | None | Age: | 53, Male |
| Airplane Rating(s): | None | Seat Occupied: | Front |
| Other Aircraft Rating(s): | None | Restraint Used: | 3-point |
| Instrument Rating(s): | None | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | Yes |
| Medical Certification: | None None | Last FAA Medical Exam: | November 4, 1980 |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | |
| Flight Time: | (Estimated) | | |

Passenger Information

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|----------------------------------|----|--|----------|
| Certificate: | | Age: | |
| Airplane Rating(s): | | Seat Occupied: | Rear |
| Other Aircraft Rating(s): | | Restraint Used: | Lap only |
| Instrument Rating(s): | | Second Pilot Present: | No |
| Instructor Rating(s): | | Toxicology Performed: | |
| Medical Certification: | | Last FAA Medical Exam: | |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | |
| Flight Time: | | | |

The pilot, who owned the trike, did not hold a pilot certificate, and his flight experience is unknown.

Aircraft and Owner/Operator Information

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|--------------------------------------|---------------|---------------------------------------|-----------------|
| Aircraft Make: | North Wing | Registration: | UNREG |
| Model/Series: | Mustang 3 | Aircraft Category: | Weight-shift |
| Year of Manufacture: | 2015 | Amateur Built: | Yes |
| Airworthiness Certificate: | None | Serial Number: | 510282 |
| Landing Gear Type: | Tricycle | Seats: | 2 |
| Date/Type of Last Inspection: | Unknown | Certified Max Gross Wt.: | 1060 lbs |
| Time Since Last Inspection: | | Engines: | 1 Reciprocating |
| Airframe Total Time: | | Engine Manufacturer: | Yamaha |
| ELT: | Not installed | Engine Model/Series: | RX-1 |
| Registered Owner: | | Rated Power: | 140 Horsepower |
| Operator: | On file | Operating Certificate(s) Held: | None |

The experimental light-sport, weight-shift-control aircraft had tricycle landing gear and a braced fabric wing. The two-place tandem cockpit frame was constructed of welded steel framing with a fiberglass cockpit fairing encompassing the frame. The wing was manufactured on December 8, 2015, and had a maximum gross weight of 1,060 pounds. The aircraft had stall speed at gross weight of 37 mph, a maximum speed of 62 mph, and a never-exceed speed of 70 mph. The aircraft's limitations included not exceeding bank angles of 60° and pitch angles of 30°. The aircraft's tachometer indicated the engine had a total time of 287 hours.

According to the *North Wing Mustang 3-15 Wing Manual*,

No wing on the market is totally safe. It is entirely possible to push any aircraft beyond its tolerances and damage or even break a wing. Very strong weather conditions may also cause structural failure. Aerobatics maneuvers, pitch angles beyond 30 degrees up or down, bank angles exceeding 60 degrees, aggressive stalls, and spins are maneuvers that should never be attempted under any circumstance.

CAUTION

The speed never to exceed for the MUSTANG 3-15 is 70 mph. The MUSTANG 3-15, even when flown in its lightest wing loading, can exceed [an] airspeed of 70 mph.”

Meteorological Information and Flight Plan

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|---|----------------------------------|---|-------------------|
| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Dusk |
| Observation Facility, Elevation: | KSLE,201 ft msl | Distance from Accident Site: | 13 Nautical Miles |
| Observation Time: | 20:56 Local | Direction from Accident Site: | 15° |
| Lowest Cloud Condition: | Clear | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 5 knots / | Turbulence Type Forecast/Actual: | None / None |
| Wind Direction: | 290° | Turbulence Severity Forecast/Actual: | N/A / N/A |
| Altimeter Setting: | 29.99 inches Hg | Temperature/Dew Point: | 27°C / 13°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Albany, OR (S21) | Type of Flight Plan Filed: | None |
| Destination: | Albany, OR | Type of Clearance: | None |
| Departure Time: | 20:00 Local | Type of Airspace: | Class G |

Wreckage and Impact Information

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|----------------------------|---------|-----------------------------|---------------------------|
| Crew Injuries: | 1 Fatal | Aircraft Damage: | Substantial |
| Passenger Injuries: | 1 Fatal | Aircraft Fire: | None |
| Ground Injuries: | | Aircraft Explosion: | None |
| Total Injuries: | 2 Fatal | Latitude, Longitude: | 44.695371,-123.08215(est) |

On-site examination of the aircraft, including the flight controls, structure, and engine, revealed no evidence of any mechanical anomalies. Ground scars and the orientation of the wreckage were consistent with the aircraft impacting the ground in a nose-low attitude. No manufacturing anomalies were noted with the aircraft. The wooden propeller assembly was shattered and exhibited signatures consistent with the engine producing power at the time of impact. Individual wires were separated at the nose; the wires were examined by the National Transportation Safety Board’s Materials Laboratory, which determined that the wires had fractured in overstress.

The pilot's family stated that a postaccident engine examination found no evidence of a preimpact mechanical malfunction or failure.

Additional Information

A video study was performed on the captured imagery to estimate the aircraft's ground track, groundspeed, altitude, and roll angle. The estimated groundspeed when the aircraft initiated a left turn was 60 ± 3 mph (52 ± 3 knots). The altitude above ground level was 233 ± 10 ft at that time. The left-wing-down roll angle increased to almost 90° about 6 seconds after the turn was initiated. The aircraft impacted the ground about 9 seconds afterward. The engine speed was within its normal range, and the aircraft roll angle was increasing at a high rate.

Administrative Information

Investigator In Charge (IIC): Keliher, Zoe

Additional Participating Persons: Ken Bradshaw; Federal Aviation Administration; Hillsboro, OR

Original Publish Date: August 16, 2023

Investigation Class: 3

Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=103450>

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](#).