Aviation Investigation Final Report

Location:	Porterville, California	**Accident Number:**	WPR22FA216
Date & Time:	June 18, 2022, 14:54 Local	**Registration:**	N3835U
Aircraft:	Cessna 336	**Aircraft Damage:**	Destroyed
Defining Event:	Flight control sys malf/fail	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Shortly after takeoff, the pilot transmitted over the radio that he had lost “almost all pitch control,” but thought that he would be able to return and land at the departure airport. Automatic Dependent Surveillance Broadcast (ADS-B) data showed that the airplane climbed to about 1,550 ft mean sea level (msl) before entering a descending right 180° turn toward the departure airport. The airplane leveled off about 1,000 ft msl and continued toward the airport. About two minutes later, the airplane entered a descent from 975 ft that continued to ground contact.

Witnesses reported that they observed the airplane flying at low altitude when it suddenly descended into the ground in a steep, nose-low, wings-level attitude.

Postaccident examination of the wreckage revealed that the bolt, castellated nut, and cotter pin that connected the balance weight to the elevator control assembly were missing. Soot was observed within the area of both connection points, including where the bolt and washer would have been installed, consistent with the hardware not being installed at the time of the accident. It is likely that the bolt separated while in flight, resulting in a loss of elevator pitch control. The missing bolt, nut, washer, and cotter pin were not located.

The airplane was painted and returned to service about 28 days before the accident, which included removal and reinstallation of all the flight controls. It could not be determined if the securing hardware (nut and cotter pin) were installed at the time of the reinstallation of the elevator.

Toxicology testing of the pilot revealed the presence of ethanol in liver tissue; however, the detected ethanol likely was from postmortem production. Thus, it is unlikely that ethanol contributed to the accident.

Probable Cause and Findings

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

Maintenance personnel's failure to properly secure the elevator control assembly hardware, which resulted in an in-flight disconnection of the elevator and elevator counterweight and the pilot's inability to maintain pitch control.

Findings

Aircraft	Elevator control system - Not specified
Aircraft	Elevator control system - Incorrect service/maintenance
Aircraft	Elevator control system - Inadequate inspection
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Enroute-cruise	Flight control sys malf/fail (Defining event)
Enroute-cruise	Collision with terr/obj (non-CFIT)

On June 18, 2022, about 1454 Pacific daylight time, a Cessna 336, N3835U, was destroyed when it was involved in an accident near Porterville, California. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* part 91 personal flight.

A pilot monitoring the airport common traffic advisory frequency reported that they heard a radio transmission from the accident pilot, who stated that he was south of Porterville Municipal Airport (PTV) and had lost "almost all pitch control." The witness recalled that the accident pilot was relayed a frequency to air traffic control and the accident pilot later stated that he was "pretty sure I'll be able to land at Porterville Airport." No further radio communication from the accident pilot was heard.

A witness located near the accident site reported that he initially heard the airplane approaching his location with the engines at a high rpm. The witness subsequently observed the airplane descending in a wings-level, approximate 45° or steeper nose down-attitude. As the airplane was about 60 ft above ground level, engine power was reduced, and the airplane continued to descend into the ground at the same nose-down angle. The witness added that the pilot did not appear to try to recover from the descent.

Recorded ADS-B data, depicted in figure 1, showed the airplane in a left climbing turn shortly after takeoff from runway 30 at Porterville Municipal Airport (PTV). The airplane climbed to about 825 ft msl on a southeasterly heading. About 1 minute and 7 seconds later, the airplane entered a right turn to a southerly heading. The airplane continued a south-southwesterly heading for about 2 minutes, 46 seconds, and climbed to about 1,550 ft msl before entering a descending right turn to a northerly heading. About 37 seconds later, the airplane leveled off about 1,000 ft msl and continued north for about 1 minute, 41 seconds. The last 6 seconds of recorded data showed the airplane in a descent from 975 ft to 725 ft near the last recorded ADS-B target, about 435 ft south of the accident site.

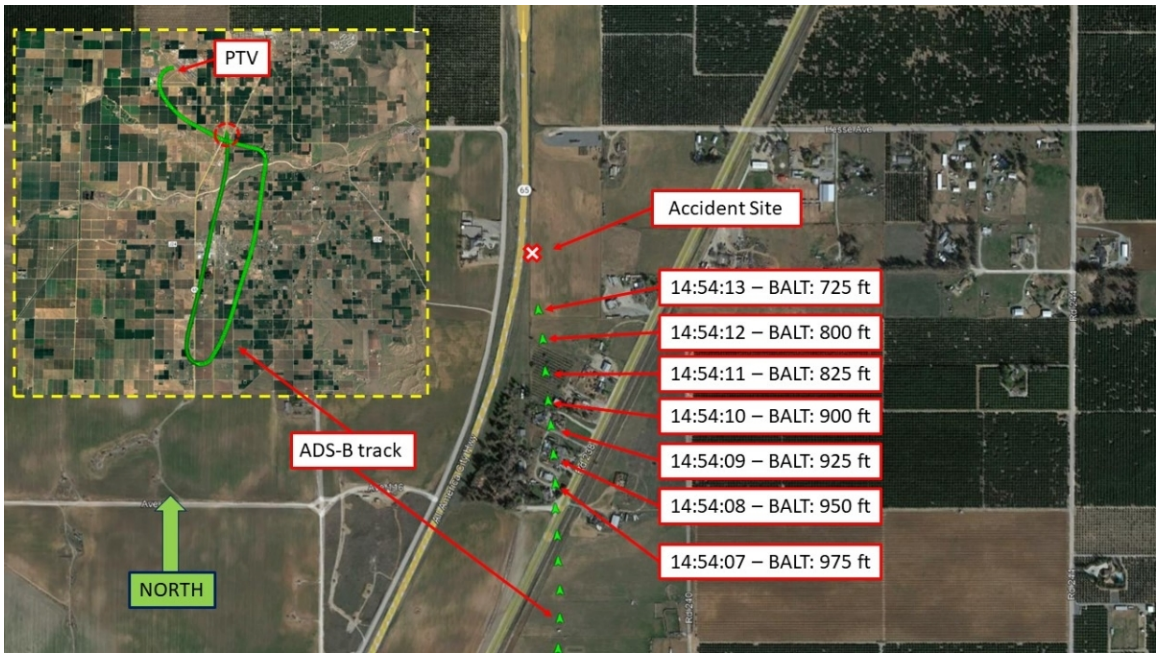

Figure 1: Recorded ADS-B Data plots.

Pilot Information

Certificate:	Private	**Age:**	31,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	June 6, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	690.3 hours (Total, all aircraft), 34.9 hours (Total, this make and model), 15.8 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3835U
Model/Series:	336	**Aircraft Category:**	Airplane
Year of Manufacture:	1964	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	336-0135
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 2, 2022 Annual	**Certified Max Gross Wt.:**	3900 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	1212.09 Hrs as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-A
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Review of the airframe logbook revealed that the airplane had been painted and returned to service on May 25, 2022. The logbook entry stated in part, "…all the flight controls were removed, stripped, primed, painted, balanced, and reinstalled in accordance with the Cessna 336 Skymaster 1964 Service Manual."

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KPTV,442 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	14:56 Local	**Direction from Accident Site:**	320°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	26°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Porterville, CA	**Type of Flight Plan Filed:**	None
Destination:	Shafter, CA (MIT)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	36.006567,-119.03956

Examination of the accident site revealed that the airplane impacted an open field immediately adjacent to a highway on a heading of about 338° magnetic. The debris field was about 234 ft in length.

The first identified point of contact (FIPC) was a ground crater about 5.5 ft in length and about 8 ft wide. Adjacent to the start of the crater were 2 distinct impact marks on the left and right side, consistent with the left and right main landing gear. Embedded within the crater was the front propeller, portions of cowling, and the nose wheel shimmy damper. Two distinct impact marks and slightly displaced dirt, consistent with the left and right wing, extended from the crater. The marks extended out to wingtip debris and were consistent with the length of the wings. Green navigation light lens fragments were observed within the debris of the right wingtip. The aileron-to-aileron bellcrank was embedded within the ground at an approximate

90° angle adjacent to the debris of the left wing.

Various instruments, fragments of avionics, cowling, and fragments of aluminum were located along the debris path. The main wreckage, which comprised the front engine, both wings, left and right booms, remains of the fuselage, and empennage was located about 25 ft from the FIPC.

The rear engine was separated from the airframe and located about 147 ft from the FIPC. The rear propeller was located about 234 ft from the FIPC.

The fuselage was mostly consumed by fire. The tailbooms were found inverted.

The left and right tail booms were impact damaged and partially consumed by fire. The left and right rudders remained attached to the empennage/tail booms and were both fire-damaged. The elevator remained attached to the horizontal stabilizer. The horizontal stabilizer remained attached to the tail booms. The elevator and horizontal stabilizer were impact and fire damaged.

Flight control continuity was mostly established throughout the airframe from the cockpit control column and rudder bar to all primary flight control surfaces; however, the left and right aileron balance cable was separated in the area of the fuselage and exhibited splayed signatures, consistent with overload.

Postaccident examination of the recovered wreckage revealed that the bolt, castellated nut, and cotter pin connecting the balance weight to the elevator control assembly were missing. Soot was observed within the area of both connection points, including where the bolt and washer would have been installed. The missing bolt, nut, washer, and cotter key were not located.

Medical and Pathological Information

An autopsy of the pilot was performed by NAAG Pathology Labs at the request of the Tulare County Sheriff's Office. According to the pilot's autopsy report, his cause of death was blunt trauma.

Toxicology testing was performed on thigh muscle and liver tissue and no tested-for substances were detected. Vitreous fluid was negative for ethanol.

Toxicology testing performed at the FAA Forensic Sciences Laboratory found 0.036 g/dL of ethanol in liver tissue. Ethanol was not detected in brain tissue. No blood or vitreous fluid was available for FAA testing.

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. Alcohol consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can sometimes be produced by microbes in a person's body after death. Postmortem ethanol production is made more likely by extensive traumatic injury and can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative.

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Jesse Sandoval; Federal Aviation Administration; Fresno, CA Andrew Hall; Textron Aviation; Wichita, KS
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Last Revision Date:	
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Note:	
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