



# Aviation Investigation Final Report

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<b>Location:</b>	New Smyrna, Florida	<b>Accident Number:</b>	ERA21LA360
<b>Date &amp; Time:</b>	September 14, 2021, 09:40 Local	<b>Registration:</b>	N161AR
<b>Aircraft:</b>	Zenith 750 Cruiser	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Flight control sys malf/fail	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

The pilot had just purchased the experimental amateur-built airplane and performed a preflight inspection that revealed no anomalies. After departure, the elevator control became momentarily jammed in the nose-down position multiple times, and the pilot elected to return to the departure airport. After two go-around maneuvers due to elevator jamming, the elevator jammed again about 10 ft above the ground during the third landing attempt. The left wing impacted the ground and the airplane veered off the runway and came to rest inverted in a pond.

Postaccident examination of the airframe revealed that the elevator bracket was becoming lodged against a nylon stop block installed in the empennage. It is likely that, while in flight, once the elevator was moved far enough in the nose-down position, the airflow around the elevator forced the elevator to contact the nylon block and jam it in the nose-down position. Examination also revealed evidence of long-term control cable contact with the empennage structure and a lack of tension on the elevator and flight control cables. A mechanic completed a condition inspection, which included examination of the flight control cables and structure, the day before the accident. Based on all available information, it is likely that this inspection was inadequate because it failed to identify and correct the flight control anomalies that ultimately resulted in the accident.

## Probable Cause and Findings

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

The mechanic's inadequate inspection of the flight control system, which resulted in a loss of airplane control.

**Findings**

<b>Personnel issues</b>	Scheduled/routine inspection - Maintenance personnel
<b>Aircraft</b>	Elevator control system - Inadequate inspection

## Factual Information

### History of Flight

<b>Prior to flight</b>	Aircraft inspection event
<b>Approach-VFR pattern final</b>	Flight control sys malf/fail (Defining event)
<b>Landing-flare/touchdown</b>	Loss of control in flight
<b>Landing</b>	Abnormal runway contact
<b>Landing-landing roll</b>	Runway excursion

On September 14, 2021, about 0940 eastern daylight time, an experimental, amateur-built Zenith 750 Cruiser, N161AR, was substantially damaged when it was involved in an accident near New Smyrna Beach, Florida. The pilot and pilot-rated passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight.

The pilot purchased the airplane on the day of the accident and intended to fly it back to Greenville, Tennessee. He conducted a short post-purchase inspection and noted that there were no brakes or throttle control for the pilot-rated passenger in the right seat. Shortly after departing X50, he “heard a very loud boom” and the airplane “jolted nose down and to the left.” The controls were locked, and the pilot could not move the control column. The pilot applied force to the controls, and they subsequently moved, and they felt free. He then decided to return to the airport, and during a left turn onto the final approach leg of the traffic pattern, the controls intermittently locked two more times and the pilot performed a go-around.

During the next approach, he heard another boom, and the controls locked again. The airplane was descending too rapidly, and the pilot performed another go-around. The pilot was able to fly the airplane back to the final approach leg of the traffic pattern without the controls locking up; however, when the airplane was about 10 ft above the runway, the controls locked again. The airplane pitched nose down and to the left and the left wing contacted the ground, followed by the nose landing gear, which collapsed. The airplane then departed the left side of the runway, impacted an embankment, and came to rest inverted in a pond.

Postaccident examination of the airplane revealed that the elevator bracket was jammed on the nylon stop block, which resulted in the elevator to remain in the nose down position until force was used to move the elevator bracket off the nylon stop block. Several cycles forward and aft of the control column resulted in the elevator bracket becoming lodged on the nylon stop block each time during the examination. The nylon stop exhibited impression marks where the elevator bracket would contact it. Additionally, the rudder and elevator cables were loose, and a bungee cord was noted holding one cable up off the empennage floor. There were marks in the structure of the empennage that exhibited evidence of long-term wear due to

control cable contact. The control stick could be moved several inches before cable tension and movement would occur.

According to the pilot, the airplane had been retrofitted with flight controls so a handicapped individual could fly it. Prior to his purchase of the airplane, the retrofitted flight controls were removed. Review of the airplane’s maintenance logs revealed that there was no entry documenting that such maintenance had occurred. The maintenance logs also noted that the airplane’s most recent condition inspection had been completed on September 13, 2021. At that time, the airplane had accumulated 45 hours of total time in service and the mechanic certified that the airplane was inspected in accordance with 14 *CFR* Part 43, Appendix D and was “found to be in a condition for safe operation.”

### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	59, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	5-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	June 9, 2021
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	June 15, 2021
<b>Flight Time:</b>	90.3 hours (Total, all aircraft), 2.7 hours (Total, this make and model), 45.8 hours (Pilot In Command, all aircraft), 8 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Zenith	<b>Registration:</b>	N161AR
<b>Model/Series:</b>	750 Cruzler	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2018	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	C75-10543
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	September 13, 2021 Condition	<b>Certified Max Gross Wt.:</b>	1440 lbs
<b>Time Since Last Inspection:</b>	1 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	45 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Viking
<b>ELT:</b>	C126 installed, not activated	<b>Engine Model/Series:</b>	130
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	130
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	EVB,10 ft msl	<b>Distance from Accident Site:</b>	5 Nautical Miles
<b>Observation Time:</b>	09:47 Local	<b>Direction from Accident Site:</b>	345°
<b>Lowest Cloud Condition:</b>	Scattered / 2000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	10 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	60°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.04 inches Hg	<b>Temperature/Dew Point:</b>	29°C / 25°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	New Smyrna, FL	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Greenville , TN (4TN5)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class E

## Airport Information

<b>Airport:</b>	MASSEY RANCH AIRPARK X50	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	10 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	36	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	4360 ft / 60 ft	<b>VFR Approach/Landing:</b>	Precautionary landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	28.978736,-80.924546(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Boggs, Daniel
<b>Additional Participating Persons:</b>	Jennifer Vitereitto; FAA/FSDO; Orlanda, FL
<b>Original Publish Date:</b>	July 26, 2023
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=103866">https://data.ntsb.gov/Docket?ProjectID=103866</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).