



# Aviation Investigation Final Report

<b>Location:</b>	Coldspring, Texas	<b>Accident Number:</b>	CEN23LA172
<b>Date &amp; Time:</b>	May 3, 2023, 13:29 Local	<b>Registration:</b>	N28HE
<b>Aircraft:</b>	Piper PA-34-200	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Flight control sys malf/fail	<b>Injuries:</b>	2 Serious
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

According to the pilot examiner, following steep turn maneuvers, they heard a loud “pop” from the tail of the airplane, the nose abruptly pitched up, and the airplane entered an accelerated stall. He took control of the airplane and added power to recover from the stall, at which time they heard another loud bang and the nose of the airplane pitched abruptly down. He reduced power to idle, there was another bang, and once again, the airplane pitched up uncontrollably. This time he did not add power and the nose of the airplane pitched down, but not as severely and he was able to use the engine power to dampen the pitch oscillations. Unable to maintain full control of the airplane, he elected for an emergency, off-airport landing. The airplane contacted trees while on approach to the field. The airplane landed hard, bounced, and slid through a rough, muddy field, which resulted in substantial damage to both wings, the fuselage, and empennage.

A postaccident examination revealed that the bolt that connects the stabilator trim rod assembly to the stabilator link assembly was missing and not located.

Since the bolt was not recovered, the reason for the separation could not be determined. Without being able to determine the reason for the separation, the flight school proactively inspected all same model airplanes in their fleet and replaced the bolt on each of them.

## Probable Cause and Findings

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

The stabilator trim rod assembly separated from the stabilator link assembly due to a missing connecting bolt, which resulted in the pilot's inability to maintain pitch control of the airplane.

## Findings

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**Aircraft**

Elevator tab control system - Not installed/available

## Factual Information

### History of Flight

<b>Maneuvering</b>	Flight control sys malf/fail (Defining event)
<b>Maneuvering</b>	Loss of control in flight
<b>Maneuvering</b>	Off-field or emergency landing

On May 3, 2023, about 1329 central daylight time, a Piper PA-34-200 airplane, N28HE, sustained substantial damage when it was involved in an accident near Coldspring, Texas. The pilot examiner and flight instructor sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 pilot certification flight.

According to the pilot examiner, following steep turn maneuvers, they heard a “loud metallic bang” from the tail of the airplane and the control yoke abruptly went to the full nose-up position. He stated the nose of the airplane pitched up rapidly, and the stall warning went off as they entered an accelerated stall. He took control of the airplane and applied full power to recover from the stall, at which time they heard another loud bang from the tail and the nose of the airplane pitched abruptly down. He reduced power to idle, there was another bang, and once again the airplane pitched up uncontrollably. This time he did not add power and the nose of the airplane pitched down, but not as severely and he was able to use the engine power to dampen the pitch oscillations. Unable to maintain full control of the airplane, he elected for an emergency, off-airport landing. While on the final approach, as the airplane clipped the tops of trees, the pilot examiner pulled the mixture controls to cutoff. Upon touchdown, the airplane bounced then slid through a rough, muddy field, which resulted in substantial damage to both wings, the fuselage, and empennage.

A postaccident examination revealed that the bolt (item 49 in figure 1) which connects the stabilator trim rod assembly (item 12) to the stabilator link assembly (item 13) was missing. (Figure 2)

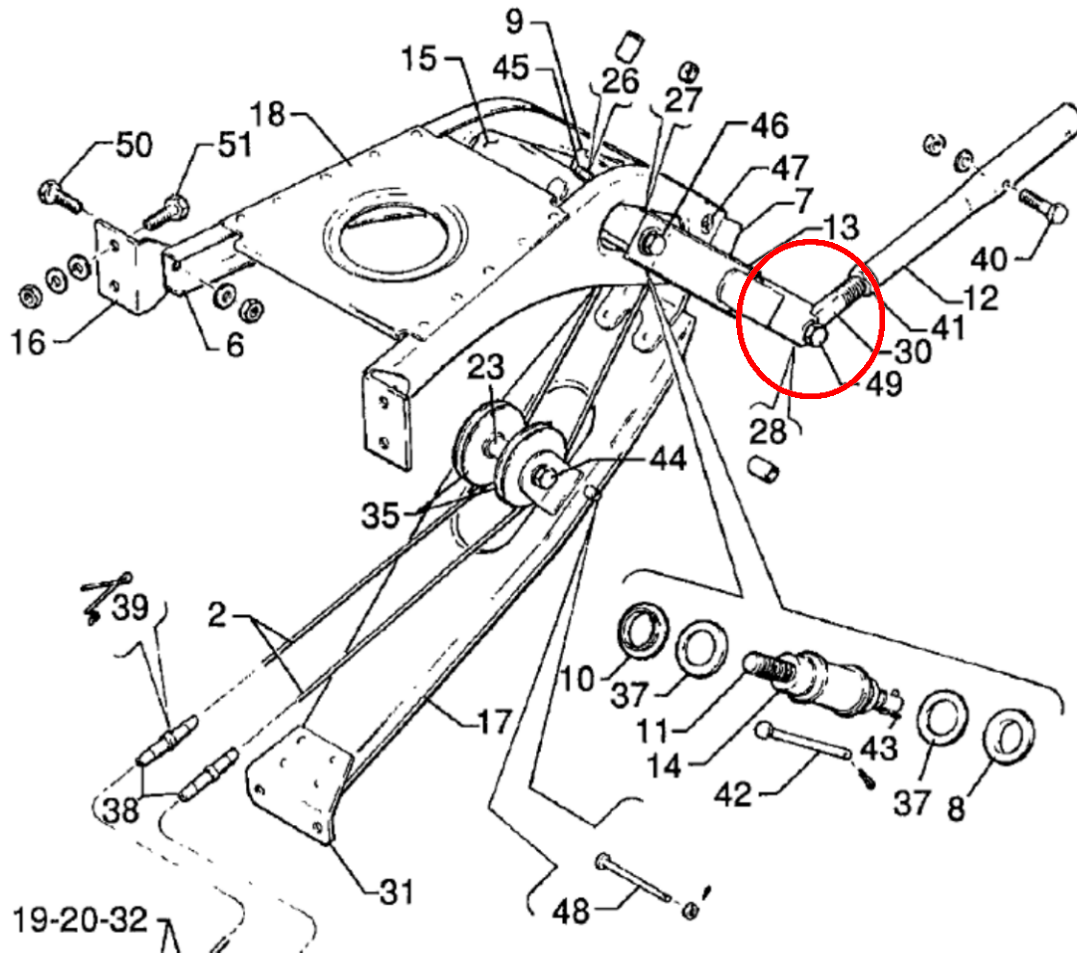


Figure 1. Illustrated Parts Catalog (Part Nos. 753-816)



Figure 2. Photo of the stabilator trim assembly (Photo courtesy of the FAA)

A review of applicable maintenance records revealed two maintenance logbook entries for the elevator trim wheel cable becoming unspooled, the first on March 14, 2023, and the second on March 23, 2023. After each repair, a functional check flight was accomplished with no discrepancies noted.

In an interview with the mechanic from the March 23 repair, he stated that he did not disconnect or otherwise perform maintenance on the affected control rod or linkage.

The pilot examiner stated that during the preflight inspection, no anomalies were noted with the trim linkage assembly.

Following the accident, the flight school inspected all PA-34 airplanes in their fleet and replaced the affected bolt on each airplane.

## Pilot Information

<b>Certificate:</b>	Airline transport; Flight instructor	<b>Age:</b>	69,
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 2 Waiver time limited special	<b>Last FAA Medical Exam:</b>	August 19, 2022
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	21
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	May 1, 2020
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	August 5, 2022
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N28HE
<b>Model/Series:</b>	PA-34-200	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1973	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	34-7350278
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	3
<b>Date/Type of Last Inspection:</b>	February 7, 2023 100 hour	<b>Certified Max Gross Wt.:</b>	4200 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	I0360
<b>Registered Owner:</b>	WINGS OVER TEXAS HOLDINGS LLC	<b>Rated Power:</b>	200 Horsepower
<b>Operator:</b>	WINGS OVER TEXAS HOLDINGS LLC	<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>	KCXO, 228 ft msl	<b>Distance from Accident Site:</b>	5 Nautical Miles
<b>Observation Time:</b>	12:53 Local	<b>Direction from Accident Site:</b>	200°
<b>Lowest Cloud Condition:</b>	Few / 4000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	8 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	100°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.96 inches Hg	<b>Temperature/Dew Point:</b>	28°C / 18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Conroe, TX (KCXO)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Conroe, TX (KCXO)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	12:30 Local	<b>Type of Airspace:</b>	Class G

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 Serious	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Serious	<b>Latitude, Longitude:</b>	30.578177,-95.177608(est)



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Williams, David
<b>Additional Participating Persons:</b>	Robert McGee; FAA; Houston, TX
<b>Original Publish Date:</b>	October 5, 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.nts.gov/Docket?ProjectID=107813">https://data.nts.gov/Docket?ProjectID=107813</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](#).