Aviation Investigation Final Report

Location:	Coldspring, Texas	**Accident Number:**	CEN23LA172
Date & Time:	May 3, 2023, 13:29 Local	**Registration:**	N28HE
Aircraft:	Piper PA-34-200	**Aircraft Damage:**	Substantial
Defining Event:	Flight control sys malf/fail	**Injuries:**	2 Serious
Flight Conducted Under:	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

Aircraft	Elevator tab control system - Not installed/available

Factual Information

History of Flight

Maneuvering	Flight control sys malf/fail (Defining event)
Maneuvering	Loss of control in flight
Maneuvering	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)

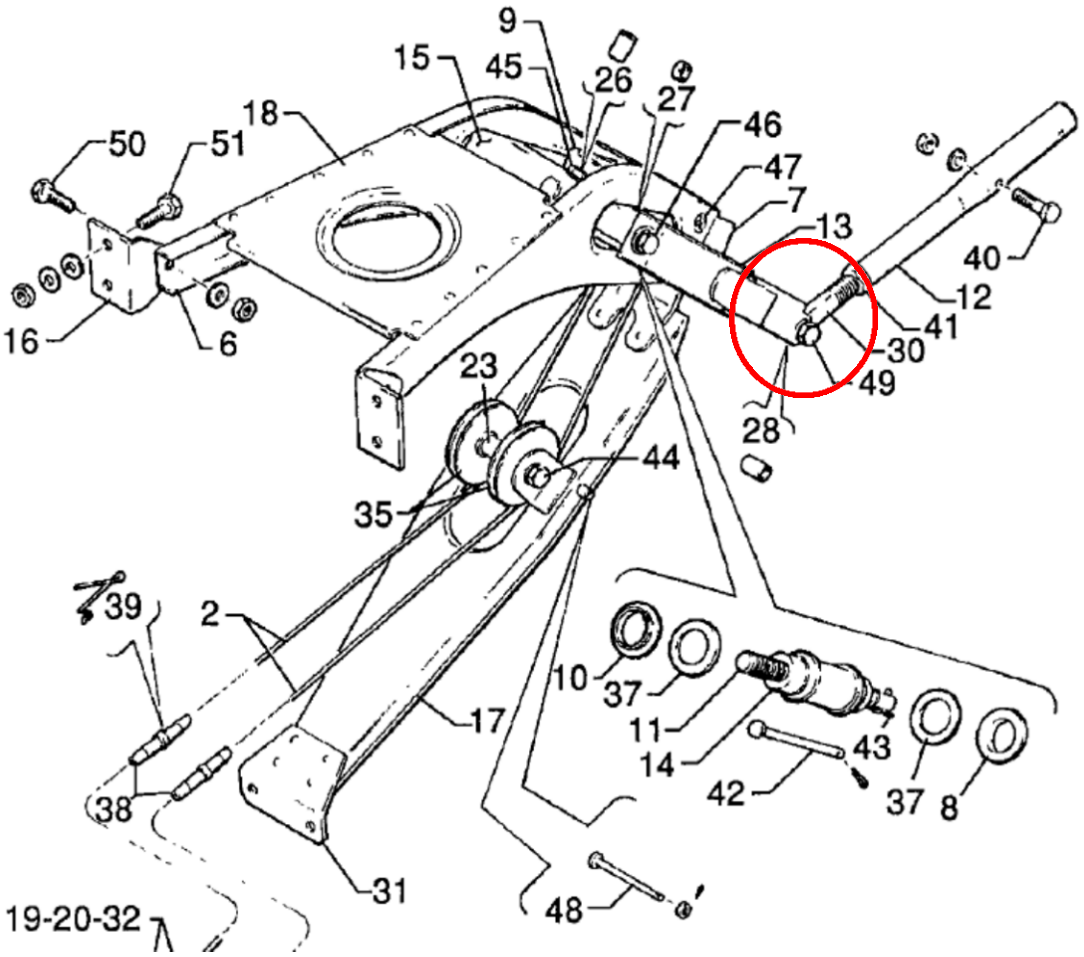

Figure 1. Illustrated Parts Catalog (Part Nos. 753-816)

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

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

Pilot Information

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

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N28HE
Model/Series:	PA-34-200	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-7350278
Landing Gear Type:	Retractable - Tricycle	**Seats:**	3
Date/Type of Last Inspection:	February 7, 2023 100 hour	**Certified Max Gross Wt.:**	4200 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO360
Registered Owner:	WINGS OVER TEXAS HOLDINGS LLC	**Rated Power:**	200 Horsepower
Operator:	WINGS OVER TEXAS HOLDINGS LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCXO,228 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	200°
Lowest Cloud Condition:	Few / 4000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	28°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Conroe, TX (KCXO)	**Type of Flight Plan Filed:**	None
Destination:	Conroe, TX (KCXO)	**Type of Clearance:**	None
Departure Time:	12:30 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	Robert McGee; FAA; Houston, TX
Original Publish Date:	October 5, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=107813