



# Aviation Investigation Final Report

<b>Location:</b>	Van Alstyne, Texas	<b>Accident Number:</b>	CEN20LA259
<b>Date &amp; Time:</b>	July 3, 2020, 10:00 Local	<b>Registration:</b>	N5539
<b>Aircraft:</b>	Sopwith Type 9400	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Flight control sys malf/fail	<b>Injuries:</b>	1 Minor, 1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Flight test		

## Analysis

During a test flight the pilot moved the control stick fully to the right to roll out of a turn, but the airplane did not respond, and the pilot suspected a failure in the aileron controls. The airplane eventually rolled wings level and the pilot elected to perform an emergency landing to a corn field, during which the airplane hit a tree and descended into the field. The wings and fuselage were substantially damaged during impact.

The pilot, who was also the builder of the airplane, examined the wreckage and determined that a rocking tube that connected the front cockpit control stick to the rear control stick had moved rearward about 1 inch. The aileron cables connected to a horn affixed to this tube. The rearward movement of the rocking tube was sufficient for the front part of the tube to come loose from its socket, which likely affected the control authority of the ailerons and resulted in the pilot's inability to control the airplane. The pilot explained that there was nothing in the original design that prevented the rocking tube from sliding aft.

## Probable Cause and Findings

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

An inflight loss of aileron control due to movement of a control connector.

## Findings

<b>Aircraft</b>	Control column section - Failure
<b>Aircraft</b>	Aileron control system - Malfunction
<b>Aircraft</b>	Lateral/bank control - Attain/maintain not possible

# Factual Information

## History of Flight

Maneuvering	Flight control sys malf/fail (Defining event)
Enroute	Loss of control in flight
Enroute	Collision with terr/obj (non-CFIT)

On July 3, 2020, a Sopwith 9400, N5539, was substantially damaged when it was involved in an accident near Van Alstyne, Texas. The pilot received minor injuries and the passenger was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 test flight.

The airplane was a reproduction of a Sopwith 1 ½ Strutter built from original factory drawings. According to the pilot, who was also the builder of the airplane, this was the 23<sup>rd</sup> test flight of the airplane. The flight was scheduled to be a short flight to confirm flying and landing wire deflections, flight control synchronization while under air loading, and to perform an aerial reconnoiter for potential obstacles at the approach end of the runway. A second crewmember was also on board, responsible for monitoring cable deflections and vibrations and control surface positions during flight and was communicating with the ground crew via text message.

The airplane performed normally through the first overflight of the airfield and a series of turns. However, when the pilot moved the control stick to the right to bring the wings level from a left turn, he noticed no resistance and the stick continued until it had reached its maximum travel. The pilot recognized this as a failure in the lower aileron circuit. Not knowing the exact location or cause of the failure, the pilot kept the control stick at its far right limit and waited for the effects of dihedral to slowly bring the wings back to level, while maintaining marginal control with back pressure on the elevator and right rudder. The airplane eventually settled wings level with a slight nose down attitude about 350 ft above ground level (agl). The pilot elected to perform an emergency landing in the cornfield in front of the airplane, during which the airplane impacted trees. The wooden-framed wing structures and fuselage were substantially damaged.

The pilot reported that a rocking tube that connected the front cockpit control stick to the rear control stick had moved rearward about 1 inch. The aileron cables connected to a horn affixed to this tube. The rearward movement of the rocking tube was sufficient for the front part of the tube to come loose from its socket, which would have affected the control authority of the ailerons. The pilot explained that there was nothing in the original design that would prevent the rocking tube from sliding aft.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	60,Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	None	<b>Last FAA Medical Exam:</b>	April 12, 2018
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	July 9, 2019
<b>Flight Time:</b>	921 hours (Total, all aircraft), 20 hours (Total, this make and model), 836 hours (Pilot In Command, all aircraft), 6 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Sopwith	<b>Registration:</b>	N5539
<b>Model/Series:</b>	Type 9400	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2019	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	5539
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	Unknown	<b>Certified Max Gross Wt.:</b>	1910 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	19.8 Hrs at time of accident	<b>Engine Manufacturer:</b>	CAMS
<b>ELT:</b>	C91 installed, not activated	<b>Engine Model/Series:</b>	Gnome
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	100 Horsepower
<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>	TKI, 586 ft msl	<b>Distance from Accident Site:</b>	15 Nautical Miles
<b>Observation Time:</b>	09:00 Local	<b>Direction from Accident Site:</b>	15°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	2 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>		<b>Temperature/Dew Point:</b>	26.7°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Van Alstyne, TX	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Van Alstyne, TX	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	BAYLIE 66XS	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	685 ft msl	<b>Runway Surface Condition:</b>	Vegetation
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<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>	1 Minor, 1 None	<b>Latitude, Longitude:</b>	33.410507,-96.570556(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Baker, Daniel
<b>Additional Participating Persons:</b>	Louis Vargo; FAA; Dallas, TX
<b>Original Publish Date:</b>	May 6, 2022
<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=101535">https://data.nts.gov/Docket?ProjectID=101535</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](#).