



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Kingsland, Texas	<b>Accident Number:</b>	CEN19FA122
<b>Date &amp; Time:</b>	April 21, 2019, 14:43 Local	<b>Registration:</b>	N25TX
<b>Aircraft:</b>	Rans S7	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot and passenger had recently completed maintenance work on the engine to address engine sputtering that occurred during steep climbs. A witness who was familiar with the troubleshooting stated that, on the day of the accident, the pilot's plan was to complete steep climbs to determine why the engine sputtered during that maneuver. The wind was from the south at 15 knots and gusting to 25 knots; the airplane departed to the south into the wind. The witness reported observing what he considered a "normal" takeoff, followed by a steep 15 to 20 second climb. At the top of the climb, the nose and left wing suddenly dropped, and the airplane entered a left-turning spiral, completing 3 to 4 slow rotations before impacting the ground. The witness stated that the engine sounded normal the whole time and he did not notice anything wrong.

The airplane impacted the ground in a nose- and left-wing-low attitude and came to rest upright. A postimpact fire consumed a majority of the airplane. A postaccident examination of the airplane did not reveal any anomalies that would have precluded normal operation; however, the examination was limited due to the extent of the fire damage.

The accident circumstances are consistent with pilot executing a steep climb to troubleshoot an engine issue. During the steep climb in gusting wind conditions, the airplane's critical angle of attack was exceeded which resulted in an aerodynamic stall, and spin into terrain.

## Probable Cause and Findings

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

The exceedance of the airplane's critical angle of attack during a steep climb after takeoff, which resulted in an aerodynamic stall and spin into terrain.

## Findings

<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	Airspeed - Not attained/maintained
<b>Aircraft</b>	Angle of attack - Not attained/maintained
<b>Environmental issues</b>	Gusts - Not specified

## Factual Information

### History of Flight

Initial climb	Aerodynamic stall/spin
Initial climb	Loss of control in flight (Defining event)

On April 21, 2019, at 1443 central daylight time, a Rans S-7S airplane, N25TX, was destroyed when it was involved in an accident near Kingsland, Texas. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

A witness reported that the pilot had just completed a few touch-and-go landings at Shirley Williams Airport before the passenger boarded the airplane. He saw the airplane taxi back to the runway, then heard it impact the ground shortly thereafter.

Another witness reported observing what he considered a "normal" takeoff, followed by a steep 15 to 20 second climb. At the top of the climb, the nose and left wing suddenly dropped, and the airplane entered a left-turning spiral, completing 3 to 4 slow rotations before impact with the ground. He stated that the engine sounded normal the whole time and he did not notice anything wrong.

### Pilot Information

Certificate:	Commercial; Private	Age:	66, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	Balloon	Restraint Used:	Unknown
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	December 30, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	215 hours (Total, all aircraft)		

## Pilot-rated passenger Information

<b>Certificate:</b>	Private	<b>Age:</b>	65, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Rear
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	August 13, 2002
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	180 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Rans	<b>Registration:</b>	N25TX
<b>Model/Series:</b>	S7 S	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2005	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special); Experimental light sport (Special)	<b>Serial Number:</b>	0304369
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	November 8, 2018 Condition	<b>Certified Max Gross Wt.:</b>	1320 lbs
<b>Time Since Last Inspection:</b>	28.9 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	188.6 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Rotax
<b>ELT:</b>		<b>Engine Model/Series:</b>	912S ULS
<b>Registered Owner:</b>		<b>Rated Power:</b>	100 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

According to the second witness who observed the accident, in March 2019, the pilot and passenger (who was also a mechanic) had completed maintenance work on the carburetors and synchronized them so that the engine ran smooth. The week before the accident, the pilot and passenger had dinner with the witness and told him that they were troubleshooting an issue where the engine would sputter during steep climbs. They told the witness that they cleaned the gascolator, checked the fuel lines, and verified that the propeller was adjusted correctly. The witness stated that, 1 day before the accident, the pilot flew the airplane with another passenger, but they just flew to get lunch and did not attempt any steep climbs. The pilot reported to him that the engine operated with no issues. The witness further stated that, on the day of the accident, the pilot's plan was to perform steep climbs and try to figure out why the engine was sputtering. The witness did not know if the accident flight was the first troubleshooting flight.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KDZB,1093 ft msl	<b>Distance from Accident Site:</b>	9 Nautical Miles
<b>Observation Time:</b>		<b>Direction from Accident Site:</b>	163°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	15 knots / 25 knots	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	180°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>		<b>Temperature/Dew Point:</b>	
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Kingsland, TX (44TE)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Kingsland, TX (44TE)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	14:42 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Shirley Williams 44TE	<b>Runway Surface Type:</b>	Grass/turf
<b>Airport Elevation:</b>	880 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	16	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	2600 ft / 100 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	On-ground
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	30.678333,-98.417503

The airplane departed on runway 16 and impacted the ground near the south end of the runway, as seen in figure 1.





Figure 1 – Aerial image of the accident site

The accident site consisted of a small initial impact point in the ground about 20 ft south of the main wreckage. The impact point was defined by a divot in the ground which contained a broken red lens, the pitot tube, and a piece of left wing tip. Another impact area was about 6 ft south of the main wreckage, which was about 3 ft in diameter and about 4 inches deep. The small crater contained white paint chips, plexiglass, a propeller blade, and the engine oil filter. Another small divot was observed under the outboard leading edge of the right wing. The three impact areas were in a relatively straight line in a north-south orientation. The airplane came to rest upright facing southwest and was mostly consumed by postcrash fire. An examination of the airframe did not reveal any anomalies that would have precluded normal operation.

The engine remained attached to the engine mounts, which were broken from the airframe. The engine was mostly intact and severely damaged by fire. The propeller hub remained attached to the crankshaft

and one blade remained attached to the hub. The second blade was broken from the hub at the blade root and was found next to the initial engine impact crater – it exhibited chordwise scratches on the face. The third blade was also broken from the hub at the blade root and was found about 20 ft west of the main wreckage – it exhibited chordwise scratches and the blade tip was separated. The engine was examined at a secure facility and exhibited significant thermal damage from the postimpact fire. The fuel pump was partially consumed by the fire and a full examination was not possible. According to the engine manufacturers guidance and the fuel pump serial number, the fuel pump had a five-year time limit and should have been replaced in 2010.

The engine did not reveal any anomalies that would have preclude normal operation; however, the examination was limited due to the thermal damage.

## **Medical and Pathological Information**

---

An autopsy of the pilot was performed by Travis County Medical Examiner, Austin, Texas. The cause of death was blunt force injuries.

Toxicology testing of specimens from the pilot, performed by the FAA Forensic Sciences Laboratory, identified three previously reported medications: amlodipine, hydrochlorothiazide, and rosuvastatin. Also present were two other medications: naproxen and salicylate. These medications would not have posed a hazard to the safety of flight.

An autopsy of the pilot-rated passenger was performed by Travis County Medical Examiner, Austin, Texas. The cause of death was blunt force injuries.

Toxicology testing of specimens from the pilot-rated-passenger did not identify any drugs or tested-for substances.

## **Preventing Similar Accidents**

### **Prevent Aerodynamic Stalls at Low Altitude**

While maneuvering an airplane at low altitude in visual meteorological conditions, many pilots fail to avoid conditions that lead to an aerodynamic stall, recognize the warning signs of a stall onset, and apply appropriate recovery techniques. Many stall accidents result when a pilot is momentarily distracted from the primary task of flying, such as while maneuvering in the airport traffic pattern, during an emergency, or when fixating on ground objects.

An aerodynamic stall can happen at any airspeed, at any altitude, and with any engine power setting. Pilots need to be honest with themselves about their knowledge of stalls and preparedness to recognize and handle a stall situation. Training can help pilots fully understand the stall phenomenon, including angle-of-attack concepts and how weight, center of gravity, turbulence, maneuvering loads and other factors can affect an airplane's stall characteristics. The stall characteristics may be different in each type of plane, so learn them before you fly.

The stall airspeeds marked on the airspeed indicator (for example, the bottom of the green arc and the bottom of the white arc) typically represent steady flight speeds at 1G at the airplane's maximum gross weight in the specified configuration. Maneuvering loads and other factors can increase the airspeed at which the airplane will stall. For example, increasing bank angle can increase stall speed exponentially.

Reducing angle of attack by lowering the airplane's nose at the first indication of a stall is the most important immediate response for stall avoidance and stall recovery. This may seem counterintuitive at low altitudes, but is a necessary first step.

See [http://www.nts.gov/safety/safety-alerts/documents/SA\\_019.pdf](http://www.nts.gov/safety/safety-alerts/documents/SA_019.pdf) for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Lindberg, Joshua		
<b>Additional Participating Persons:</b>	Randall Kaser; Federal Aviation Administration; San Antonio, TX Christoph Ringl; Austrian Ministry for Transport Jordan Paskevich; Rotech Flight Safety		
<b>Original Publish Date:</b>	May 27, 2021	<b>Investigation Class:</b>	3
<b>Note:</b>	The NTSB traveled to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=99289">https://data.nts.gov/Docket?ProjectID=99289</a>		



The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).