



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Westbrook, Minnesota	<b>Accident Number:</b>	CEN18LA332
<b>Date &amp; Time:</b>	August 15, 2018, 11:45 Local	<b>Registration:</b>	N5521X
<b>Aircraft:</b>	Aero Commander S2R	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Runway excursion	<b>Injuries:</b>	1 Minor
<b>Flight Conducted Under:</b>	Part 137: Agricultural		

## Analysis

The commercial pilot reported that the airplane experienced a loss of engine power at rotation during takeoff. The airplane cleared a soybean field off the end of the runway and then a two-lane road before entering a corn field on the opposite side of the road. The airplane traveled about 300 ft into the corn field with 8-ft-tall corn before nosing over and coming to rest. A postaccident examination did not reveal any anomalies consistent with a loss of engine power or a mechanical failure or malfunction of the flight control system.

Engine monitor data revealed that the accident takeoff was the fifth takeoff of the day. At the beginning of the takeoff, the engine speed and torque increased smoothly to full power. About 50 seconds after the takeoff began, the engine speed and torque decreased abruptly over 3 or 4 seconds consistent with the encounter with the corn field.

The distance that the airplane traveled into the corn field was consistent with normal acceleration under full engine power during the takeoff run. The engine monitor data revealed that the engine was producing full power until encountering the corn field with no evidence of a loss of engine power. Thus, because the available evidence indicated that the airplane was operating normally at the time of the accident, the investigation was unable to determine why the runway excursion occurred.

## Probable Cause and Findings

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

A runway excursion during takeoff for reasons that could not be determined based on the available evidence.

## Findings

<b>Not determined</b>	(general) - Unknown/Not determined
<b>Environmental issues</b>	(general) - Contributed to outcome

# Factual Information

## History of Flight

Takeoff	Runway excursion (Defining event)
Takeoff	Collision with terr/obj (non-CFIT)
Takeoff	Nose over/nose down

On August 15, 2018, about 1145 central daylight time, an Aero Commander S2R, N5521X, was substantially damaged during a runway excursion on takeoff from runway 9 at the Rolling Hills Airport (3MN4), Westbrook, Minnesota. The operator stated that the airplane did not climb as expected after takeoff and it encountered a corn field off the end of the runway. The pilot was not injured. The airplane was registered to and operated by Olsem Aerial Application Service as a Title 14 *Code of Federal Regulations* Part 137 flight. Day visual meteorological conditions prevailed. The local flight was not operated on a flight plan. The flight was originating at the time of the accident.

The pilot informed a Federal Aviation Administration (FAA) inspector that he had experienced a loss of engine power at rotation during takeoff. The pilot reported that there were two small rises along the turf runway. The airplane normally became airborne at the second rise. The accident takeoff proceeded normally past the first rise. However, as the airplane approached the second rise, the tail of the airplane dropped to the ground. The pilot perceived a loss of engine power and began to drop the application load immediately afterward. The operator stated that the airplane was fueled before the accident flight and was within the maximum gross weight limitation at the time of the accident.

The airstrip was oriented east-west and the accident takeoff was preformed toward the east. A soybean field was located immediately off the end of the runway, followed by a two-lane roadway, and a corn field. The soybean field exhibited evidence of the application load being dropped as the airplane passed over but appeared to be otherwise undisturbed. The airplane continued across the intervening two-lane roadway and traveled about 300 ft into the corn field, leveling the existing 8-foot corn crop, before nosing over and coming to rest. A postaccident examination conducted by FAA inspectors did not reveal any anomalies consistent with a loss of engine power or a failure or malfunction of the flight control system.

The airplane was equipped with an engine monitor unit which was recovered from the wreckage and downloaded. A review of the data indicated that the accident takeoff was the fifth of the day. The data revealed a momentary exceedance of the interstage turbine temperature (ITT) on the initial engine start of the day consistent with a hot start event. Otherwise, the engine parameters appeared to be within normal operating limits during the previous flights. The engine was not shutdown between flights.

The data revealed that, at the beginning of the accident takeoff, the engine speed increased smoothly from an idle speed of about 64% to 99% over a period of 5 seconds, and it remained at or above 97% for the remainder of the takeoff run. The fuel flow and oil pressure increased in conjunction with the engine speed. The engine torque increased in conjunction with the engine speed and subsequently stabilized at 100% about 35 seconds later. Each of the noted parameters stabilized within normal operating

limitations during the takeoff run and were consistent with the engine operating normally at full takeoff power. About 50 seconds after the takeoff began, the engine speed and torque parameters decayed abruptly. The engine speed decreased from 98.3% to zero over a 4-second time interval. The engine torque increased momentarily to 106% before decreasing to zero over the following 3-second interval. The abrupt decrease in engine speed and torque was consistent with the encounter with the corn field.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	46, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Single
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<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>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	February 28, 2018
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	5600 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Aero Commander	<b>Registration:</b>	N5521X
<b>Model/Series:</b>	S2R	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1973	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Restricted (Special)	<b>Serial Number:</b>	1721R
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>	Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	Turbo prop
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Honeywell
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	TPE-331-6
<b>Registered Owner:</b>		<b>Rated Power:</b>	750 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Agricultural aircraft (137)

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	MWM,1411 ft msl	<b>Distance from Accident Site:</b>	13 Nautical Miles
<b>Observation Time:</b>	11:35 Local	<b>Direction from Accident Site:</b>	90°
<b>Lowest Cloud Condition:</b>	Scattered / 1600 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	360°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.96 inches Hg	<b>Temperature/Dew Point:</b>	25°C / 20°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Westbrook, MN (3MN4)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Westbrook, MN (3MN4)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:45 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Rolling Hills 3MN4	<b>Runway Surface Type:</b>	Grass/turf
<b>Airport Elevation:</b>	1477 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	9	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	2250 ft / 60 ft	<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>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Minor	<b>Latitude, Longitude:</b>	43.950832,-95.378334(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Sorensen, Timothy
<b>Additional Participating Persons:</b>	Raymond A Peterson; FAA Flight Standards; Minneapolis, MN
<b>Original Publish Date:</b>	November 6, 2019
<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=98075">https://data.nts.gov/Docket?ProjectID=98075</a>

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