



# Aviation Investigation Final Report

<b>Location:</b>	Sioux Falls, South Dakota	<b>Accident Number:</b>	CEN18LA164
<b>Date &amp; Time:</b>	April 29, 2018, 22:30 Local	<b>Registration:</b>	N172GA
<b>Aircraft:</b>	Beech 1900C	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Sys/Comp malf/fail (non-power)	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 135: Air taxi & commuter - Non-scheduled		

## Analysis

As the twin-engine, turbopropeller-equipped airplane started to taxi for takeoff, the right main landing gear collapsed, deforming the aft center wing lower spar cap. A postaccident examination of the airplane revealed that the right main landing gear drag brace bolt failed at the wing forward attach point. As the airplane moved forward, the strut pivoted aft, collapsing the landing gear. The drag brace bolt was not retained, and the reason for its failure could not be determined based on the available information.

## Probable Cause and Findings

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

Failure of the right main landing gear drag brace bolt for reasons that could not be determined based on the available information.

## Findings

<b>Aircraft</b>	Main landing gear attach sec - Failure
<b>Aircraft</b>	Spar (on wing) - Fatigue/wear/corrosion

## Factual Information

### History of Flight

<b>Taxi</b>	Sys/Comp malf/fail (non-power) (Defining event)
<b>Taxi</b>	Landing gear collapse

On April 29, 2018, about 2230 central daylight time, a Beech 1900C, N172GA, was substantially damaged when the right main landing gear collapsed as the airplane started to taxi for takeoff at Joe Foss Field Airport (FSD), Sioux Falls, South Dakota. The airline transport pilot was not injured. The airplane was registered to and operated by Alpine Aviation, doing business as Alpine Air Express, under the provisions of Title 14 *Code of Federal Regulations* Part 135 as a non-scheduled domestic cargo flight. Visual meteorological conditions prevailed at the airport at the time of the accident, and an instrument flight rules flight plan had been filed. The flight was originating from FSD, and was destined for Rapid City Regional Airport (RAP), Rapid City, South Dakota.

According to Federal Aviation Administration (FAA) inspectors, the airplane had just moved forward to taxi for takeoff when the right main landing gear collapsed. A postaccident examination of the airplane revealed the right main landing gear drag brace bolt failed at the wing forward attach point. The drag brace bolt was not retained for further examination. The strut pivoted aft when the airplane moved forward, and the landing gear collapsed. The aft center wing lower spar cap was dented and deformed up to 0.090". Further examination found pitting corrosion on the spar cap.

### Pilot Information

<b>Certificate:</b>	Airline transport; Commercial; Flight instructor	<b>Age:</b>	57, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<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>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	October 13, 2017
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	November 28, 2017
<b>Flight Time:</b>	13968 hours (Total, all aircraft), 1000 hours (Total, this make and model), 8000 hours (Pilot In Command, all aircraft), 133 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N172GA
<b>Model/Series:</b>	1900C	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1982	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	UB-11
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	March 10, 2018 AAIP	<b>Certified Max Gross Wt.:</b>	16600 lbs
<b>Time Since Last Inspection:</b>	117 Hrs	<b>Engines:</b>	2 Turbo prop
<b>Airframe Total Time:</b>	41851 Hrs at time of accident	<b>Engine Manufacturer:</b>	Pratt & Whitney
<b>ELT:</b>	C91 installed, not activated	<b>Engine Model/Series:</b>	PT6A-65B
<b>Registered Owner:</b>	Alpine Aviation, Inc.	<b>Rated Power:</b>	1100 Horsepower
<b>Operator:</b>	Alpine Aviation, Inc.	<b>Operating Certificate(s) Held:</b>	On-demand air taxi (135)
<b>Operator Does Business As:</b>	Alpine Air Express	<b>Operator Designator Code:</b>	TIMA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Night
<b>Observation Facility, Elevation:</b>	KFSD,1429 ft msl	<b>Distance from Accident Site:</b>	0 Nautical Miles
<b>Observation Time:</b>	22:56 Local	<b>Direction from Accident Site:</b>	0°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 10000 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	15 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	160°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.79 inches Hg	<b>Temperature/Dew Point:</b>	20°C / 7°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Sioux Falls, SD (FSD )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Rapid City, SD (RAP )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	22:30 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Joe Foss Field FSD	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	1429 ft msl	<b>Runway Surface Condition:</b>	
<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 None	<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 None	<b>Latitude, Longitude:</b>	43.581943,-96.741943(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Scott, Arnold
<b>Additional Participating Persons:</b>	Kenneth Joyce; FAA Flight Standards District Office; Salt Lake City, UT
<b>Original Publish Date:</b>	May 29, 2019
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=97218">https://data.ntsb.gov/Docket?ProjectID=97218</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](#).