Aviation Investigation Final Report

Location:	Fairbanks, Alaska	**Accident Number:**	ANC18LA048
Date & Time:	June 22, 2018, 17:30 Local	**Registration:**	N3125D
Aircraft:	Cessna 180	**Aircraft Damage:**	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to the pilot, he was landing with a right crosswind, and after touchdown, as the airplane began to decelerate, he applied left brake to maintain directional control. He stated that the left brake pedal was "soft" and traveled to its full forward limit. The airplane weathervaned and skidded sideways before the left main wheel went off the landing area and into brush. The left wing and left horizontal stabilizer impacted terrain, which resulted in substantial damage. The pilot noted in a postflight examination that the brake line had separated at the compression fitting near the brake caliper where the brake line transitioned from a rigid line to a flexible line.

A laboratory examination of the brake line and its components revealed that the interior surface of the failed end had circumferential marks consistent with formation of a flared end with a flaring tool. The sleeve was trapped within the nut from the failed end, and deposits of gray metal appearing consistent with deformed brake tube material were observed deposited on internal threads of the nut.

According to Federal Aviation Administration Advisory Circular AC 43-13-1B, "Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair," a double flare is used on soft aluminum tubing having a 3/8-inch outside diameter or less. No evidence of folded walls consistent with a double flare was noted at either end of the brake line tube.

No records could be found that showed the manufacture or assembly date of the fractured brake line components.

Probable Cause and Findings

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

The failure of the brake line tube due to an improper flare.

Findings

Aircraft	Brake - Failure
Aircraft	Brake - Related maintenance info
Personnel issues	(general) - Other

Factual Information

History of Flight

Landing-landing roll	Sys/Comp malf/fail (non-power) (Defining event)
Landing-landing roll	Loss of control on ground

On June 22, 2018, about 1730 Alaska daylight time, a tailwheel equipped Cessna 180 airplane, N3125D, sustained substantial damage during an off-airport landing at Upper St George Creek, about 50 miles south of Fairbanks, Alaska. The airplane was registered to and operated by the pilot as a 14 *Code of Federal Regulations* (CFR) Part 91 visual flight rules personal flight when the accident occurred. The private pilot and passenger were uninjured. Visual meteorological conditions prevailed, and no flight plan had been filed. The flight departed Fairbanks International Airport (PAFA), Fairbanks, Alaska about 1700.

According to the pilot, he was landing with a right crosswind and after touchdown, as the airplane began to decelerate, he applied left brake in an effort to maintain directional control. He stated that the left rudder/brake pedal was "soft" and traveled to its full forward limit and directional control was lost. The airplane weathervaned into the wind and skidded sideways before the left main wheel went off the cleared landing area and into brush. The left wing and left horizontal stabilizer subsequently impacted terrain, which resulted in substantial damage.

Upon exiting the airplane, the pilot found the brake line had separated at the compression fitting near the brake caliper where the brake line transitioned from a rigid line to a flexible line.

The brake line tube and fitting hardware was removed from the airplane and sent to the NTSB Materials Laboratory in Washington DC for further evaluation. The interior surface of the failed end had circumferential marks up to 0.136 inch from the end consistent with the formation of a flared end with a flaring tool. The sleeve was trapped within the nut from the failed end, and deposits of gray metal appearing consistent with deformed brake tube material was observed deposited on internal threads of the nut up to 3 threads from the end of the sleeve.

According to Federal Aviation Administration Advisory Circular AC 43-13-1B, *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair*, a double flare is used on soft aluminum tubing having a 3/8-inch outside diameter or less. No evidence of folded walls consistent with a double flare was noted at either end of the submitted brake line tube.

No records could be located that showed the manufacture or assembly date of the fractured brake line components.

Pilot Information

Certificate:	Private	**Age:**	45,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	April 30, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 30, 2017
Flight Time:	181 hours (Total, all aircraft), 132 hours (Total, this make and model), 145 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3125D
Model/Series:	180	**Aircraft Category:**	Airplane
Year of Manufacture:	1955	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	31923
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	February 7, 2018 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	11 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3192.8 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	O-470 SERIES
Registered Owner:	On file	**Rated Power:**	225 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PAFA,432 ft msl	**Distance from Accident Site:**	37 Nautical Miles
Observation Time:	00:53 Local	**Direction from Accident Site:**	3°
Lowest Cloud Condition:	Scattered / 4500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 6000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	14 knots / 18 knots	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	20°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	FAIRBANKS, AK (FAI)	**Type of Flight Plan Filed:**	None
Destination:	Fairbanks, AK (AK7)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class E

Airport Information

Airport:	GOLD KING CREEK AK7	**Runway Surface Type:**	Dirt
Airport Elevation:	1720 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	64.192779,-147.946105(est)

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	Tom Dehart; FAA; Anchorage, AK
Original Publish Date:	June 8, 2020
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97569