Aviation Investigation Final Report

Location:	Haines, Alaska	**Accident Number:**	ANC16LA048
Date & Time:	July 18, 2016, 12:30 Local	**Registration:**	N343C
Aircraft:	Stinson 108	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot stated that, during the landing roll in the tailwheel-equipped airplane, he started a right turn to exit the runway using a high-speed taxiway when the airplane had slowed to about 20 mph. During the exit, the airplane made an abrupt right turn that the pilot could not control with left rudder and brake. The left wheel axle fractured, followed by a collapse of the left landing gear leg, which resulted in substantial damage to the airplane. The reported wind was a left quartering tailwind of 4 knots. The pilot and passenger observed variable gusting wind immediately after the accident. Postaccident examination after recovery of the wreckage found that the tailwheel attachment bracket was fractured.

An examination of the left main landing gear axle weld fracture with a scanning electron microscope (SEM) revealed features consistent with tensile overstress that would have occurred during the accident sequence.

An examination of the airframe tailwheel mount fracture surface with a SEM revealed signatures consistent with overstress failure, and other fracture areas of widespread corrosion.

Photographs taken before the airplane was removed from the runway showed the tailwheel assembly in its normal position, with no abnormalities visible. Also, during the recovery of the airplane, no tailwheel separation or abnormal function was observed. Based on the examinations of the fractured components, there is no evidence that the fracture of the tailwheel mount led to a displacement of the tailwheel assembly or a loss of control during the landing.

Based upon the pilot and passenger's statements regarding wind at the accident site, it is possible that an unexpected gust of quartering tailwind initiated a loss of control, and the high groundspeed and heavy landing weight contributed to increased lateral loads on the left landing gear during the ground loop, which resulted in overload failures of the axle and tail bracket welds.

Probable Cause and Findings

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

The pilot's failure to maintain directional control of the airplane during the landing roll with a quartering tailwind, which resulted in a ground loop and overstress failure of the left main landing gear wheel axle.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Directional control - Not attained/maintained
Aircraft	Main landing gear - Capability exceeded
Aircraft	Nose/tail gear attach section - Fatigue/wear/corrosion

Factual Information

History of Flight

Landing-landing roll	Loss of control on ground (Defining event)
Landing-landing roll	Aircraft structural failure
Landing-landing roll	Collision with terr/obj (non-CFIT)

On July 18, 2016, about 1230 Alaska daylight time, a tailwheel-equipped Stinson 108 airplane, N343C, sustained substantial damage following a loss of control during the landing rollout at Haines Airport, Haines, Alaska. The certificated private pilot, and three passengers were not injured. The airplane was registered to and operated by the pilot, as a visual flight rules (VFR) personal flight, under the provisions of 14 *Code of Federal Regulations (CFR) Part* 91. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The flight departed the Skagway Airport (SGY), Alaska, at about 1200, destined for the Haines Airport (HNS).

The pilot stated in the National Transportation Safety Board (NTSB) Form 6120.1, that he listened to the automated weather at HNS prior to arrival. He elected to land runway 26 with a quartering tailwind because the winds were light and variable. He performed a normal wheel landing, and during the roll out, when the airplane was about 20 mph, he started a right turn towards taxiway B, a high-speed exit taxiway. As he initiated the turn, the airplane abruptly turned right, which resulted in a 180° right ground loop. The pilot stated that he applied full left rudder and left brake during the turn, however the right turn continued. The left main landing gear collapsed and the fuselage and left wing impacted the runway surface. Substantial damage was sustained by the left wing, aileron, lift strut and lower fuselage. The pilot also stated that the winds were stronger and gusting from various directions after the accident.

In an interview, a passenger who was in the front right seat stated that during the approach he heard the automated weather at HNS report wind at 4 knots, but he could not remember the reported direction. He said that the landing felt normal to him, however near the end of the landing roll, the airplane made an unexpected abrupt right turn, and then collapsed onto the left side during the ground loop. He stated that after the accident he noticed that the winds were gusting at times.

Photographs revealed metal scrapes on the runway surface that were collocated with rubber wheel skid marks from the left main landing gear wheel. The ground scars began about 50 feet prior to the tight ground loop signatures. The left main landing gear wheel assembly separated from the left main landing gear leg at the axle weld, and came to rest about 15 feet behind the wreckage. The left main landing gear leg separated from the fuselage near the upper shock strut attachment points. There were no tailwheel abnormalities observed at the accident scene. The airplane was towed to a hangar on the right main landing gear wheel and tailwheel.

During a post-accident examination of the airplane after recovery, the pilot discovered that the airframe tailwheel assembly attachment mount was fractured through the entire width. The bracket is one of two

airframe attachments points for the tailwheel assembly. The tailwheel attachment mount and left main landing gear wheel hub and axle were sent to the NTSB Material Laboratory for detailed examinations.

An NTSB materials engineer conducted a detailed examination of the fractured tailwheel assembly. Features consistent with corrosion intermixed with overstress failure were present at the bracket weld. The fractured surface of the left wheel axle was also examined. The features on this fracture surface were generally consistent with tensile overstress, such as microscopic dimple ruptures. The wheel axle also exhibited some areas with intergranular fracture and irregular weld material. A Materials Laboratory Factual Report is included in the public docket.

The airplane had total time of 3,305 hours, and an annual inspection had been completed on August 14, 2015. According to the pilot's statement, the landing weight was estimated at 2200 lbs., which was 30 lbs. under the maximum gross weight limit for this airplane. The pilot originally stated the landing weight at 2240 lbs. on the NTSB form 6120.1, but then changed it via email.

The pilot had logged about 1001 total flight hours and 900 hours of pilot in command time in the accident airplane. His last biennial flight review was conducted in the accident airplane on March 29, 2016.

The closest weather reporting facility was HNS. At 1154, a HNS METAR reported in part: wind from 150° at 3 knots; sky condition, clear; visibility 10 statute miles; temperature 70° F; dew point 57° F; barometric pressure 29.90 inches of mercury.

Pilot Information

Certificate:	Private	**Age:**	61,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	March 1, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 31, 2015
Flight Time:	(Estimated) 1001 hours (Total, all aircraft), 900 hours (Total, this make and model), 1000 hours (Pilot In Command, all aircraft)		

Passenger Information

Certificate:		**Age:**	Female
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Stinson	**Registration:**	N343C
Model/Series:	108	**Aircraft Category:**	Airplane
Year of Manufacture:	1947	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	108-3343
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	August 14, 2015 Annual	**Certified Max Gross Wt.:**	2230 lbs
Time Since Last Inspection:	96 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3305.2 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-435
Registered Owner:	On file	**Rated Power:**	175 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:	PAHN,16 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:54 Local	**Direction from Accident Site:**	97°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.89 inches Hg	**Temperature/Dew Point:**	21°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Skagway, AK (SKG)	**Type of Flight Plan Filed:**	None
Destination:	Haines, AK (HNS)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	HAINES HNS	**Runway Surface Type:**	Asphalt
Airport Elevation:	15 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	4000 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	59.243888,-135.523605(est)

Administrative Information

Investigator In Charge (IIC):	Price, Noreen
Additional Participating Persons:	Gary Stears; FAA Juneau FSDO; Juneau, AK
Original Publish Date:	September 11, 2018
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=93649