Aviation Investigation Final Report

Location:	Fort Collins, Colorado	**Accident Number:**	CEN21LA241
Date & Time:	May 28, 2021, 10:30 Local	**Registration:**	N119JP
Aircraft:	Pipistrel Alpha Trainer	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor reported that he and the pilot took off in the airplane to conduct a flight review and proceeded to the practice area. They conducted flight review maneuvers, emergency procedures, and the flight instructor demonstrated a power-on stall. The pilot took over the controls and when he added power, the engine did not respond. He manipulated the throttle several times, but the engine had reduced to idle power and would not change. The flight instructor initiated an emergency landing. The airplane descended to a nearby field and touched down. The nosewheel sank into a small ridge and the airplane flipped upside down and slid to a stop.

A postaccident examination of the throttle/choke splitter assembly revealed the single throttle cable, which runs to the cockpit, separated from the throttle/choke cable splitter assembly. A metallurgical examination revealed a lack of solder material where the input throttle cable connects to the terminal end of the splitter assembly. The lack of solder material left a void in the cable connection with the terminal fitting, which allowed the individual cable strands to fail in a progressive manner, until the cable eventually separated from the terminal fitting. A lack of solder was also noted at the output end of the throttle cable connection with the splitter assembly. The choke cable connections were normal.

The airplane maintenance manual indicates that the throttle and control cables need to be replaced every 5 years. In addition, the manual cautions that “all of the time limits…. must be considered when performing the 100 hour/annual inspection. Removal or overhaul of any these items must be entered into the aircraft technical logbook.” There is no logbook entry that explicitly states that the throttle and choke cables were replaced. Therefore, it could not be determined who produced the deficient solder joints or how long they had been in service.

Probable Cause and Findings

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

A partial loss of engine power due to the failure of the throttle control cable, which resulted in the loss of control of the dual carburetor system. The cable failure was a result of improper soldering at the throttle cable input terminal on the splitter assembly, which led to the progressive separation of the cable strands.

Findings

Aircraft	Power lever - Failure
Personnel issues	Fabrication - Unknown/Not determined
Environmental issues	Rough terrain - Contributed to outcome

Factual Information

History of Flight

Enroute	Loss of engine power (partial) (Defining event)
Landing-flare/touchdown	Nose over/nose down

On May 28, 2021, about 1040 mountain daylight time, a Pipistrel Alpha Trainer, N119JP, was substantially damaged when it was involved in an accident near Fort Collins, Colorado. The pilot/airplane owner sustained minor injuries and the flight instructor sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The flight instructor reported that the purpose of the flight was to give the pilot a flight review. He reported that they took off and proceeded to a practice area where they conducted flight review maneuvers, emergency procedures, and the flight instructor demonstrated a power on stall. The pilot took over the controls and when he added power, the engine did not respond. He manipulated the throttle several times, but the engine power had reduced to idle and would not change. The pilot informed the flight instructor that the throttle cable was loose at which time the flight instructor took control of the airplane. The flight instructor initiated an emergency landing. The airplane descended to a nearby field and touched down. The nosewheel sank into a small ridge and the airplane flipped upside down and slid to a stop. The airplane exhibited substantial damage to the fuselage structure and empennage.

This engine has two carburetors; each carburetor has a throttle and choke. The throttle cables from each carburetor run to the throttle/choke assembly where they attach to a splitter. On the other side of the splitter is one cable that runs to the cockpit control. The same design is used for the choke.

During a postaccident examination by the Federal Aviation Administration, the throttle cable from the cockpit appeared to fracture near the throttle/choke assembly. As installed, this cable did not have any abnormal or abrupt bends, nor did it show indications of rubbing on other engine components. The only damage to the cable was near the area of the fracture. The throttle/choke assembly, along with the throttle and choke cables, were removed from the engine and shipped to the National Transportation Safety Board materials laboratory for further examination.

Examination of the throttle/choke splitting assembly revealed the single throttle input cable, which runs to the cockpit control, separated within the terminal fitting end of the splitter assembly, thereby disabling the throttle control. The throttle control input cable is coated with flux paste, inserted into a terminal fitting, clamped with a set screw, and joined to the terminal by solder introduced through a hole at the forward end of the terminal. The terminal is then inserted into a through-hole on the side of the splitter fitting. The metallurgical examination of the throttle control cable's input terminal fitting revealed a void where the solder had not filled the joint. The throttle cable strands showed indications of progressive cracking over time. In addition, the edges of some of the threads were flattened, consistent with rubbing within the terminal which was a result of the lack of solder. Further examination

of the splitter itself revealed the solder also did not fill the output side of the splitter cavity. Both the input and output choke cable attachments on the splitter assembly were normal.

Revision A00 of the Pipistrel maintenance manual, dated March 22, 2019, indicates that the throttle and control cables need to be replaced every 5 years. In addition, the manual indicates “CAUTION: all of the time limits…. must be considered when performing the 100 hour/annual inspection. Removal or overhaul of any these items must be entered into the aircraft technical log book.” An entry in the engine logbook, dated March 1, 2019, states, “5 Year Maintenance LOA (#027-17) per Pipistrel’s and Rotax 912 UL instructions Pipistrel ITALIA s.r.l. certifies that Pipistrel aircraft S/N 478 AT912 LSA still complies to the applicable ASTM airplane design and continued airworthiness standard subsequent to completion of the modifications outlined above, as long as they’re performed according to this LOA #027-17 and it’s supporting documentation (if any is referenced or attached.)” It could not be determined from this entry if the throttle cable was replaced when this logbook entry was made.

ADDITIONAL INFORMATION

As a result of this accident, Service Bulletin (SB)-100-00-80-012, Throttle and Choke Cable Replacement, was issued on July 26, 2021. The SB calls for the throttle and choke cables to be replaced before/at the next scheduled maintenance if one of the following conditions are met: 1) Throttle and choke cables are 5 years of age or older, or 2) Throttle or choke cables have been replaced at any point in the aircraft’s lifetime.

Pilot Information

Certificate:	Sport Pilot	**Age:**	64,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	BasicMed Without waivers/limitations	**Last FAA Medical Exam:**	May 9, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Flight instructor Information

Certificate:	Flight instructor; Private; Sport Pilot	**Age:**	59,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Sport pilot	**Last FAA Medical Exam:**	
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1102 hours (Total, all aircraft), 33 hours (Total, this make and model), 904 hours (Pilot In Command, all aircraft), 88 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Pipistrel	**Registration:**	N119JP
Model/Series:	Alpha Trainer	**Aircraft Category:**	Airplane
Year of Manufacture:	2012	**Amateur Built:**	
Airworthiness Certificate:	Special light-sport (Special)	**Serial Number:**	478 AT 912 LSA
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	May 25, 2021 Annual	**Certified Max Gross Wt.:**	1212 lbs
Time Since Last Inspection:	22.4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	616 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	912 UL2
Registered Owner:	St. Croix Lightplanes LLC	**Rated Power:**	
Operator:	William F. Snodgrass	**Operating Certificate(s) Held:**	None
Operator Does Business As:	Colorado Sport Pilot, LLC	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KFNL,5015 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	10:56 Local	**Direction from Accident Site:**	247°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	17°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Loveland, CO (FNL)	**Type of Flight Plan Filed:**	None
Destination:	Loveland, CO (FNL)	**Type of Clearance:**	VFR
Departure Time:	09:41 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	40.4518,-105.01134(est)

Administrative Information

Investigator In Charge (IIC):	Link, Samantha
Additional Participating Persons:	Joseph Chavez; Federal Aviation Administration ; Denver, CO
Original Publish Date:	December 14, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=103177