Aviation Investigation Final Report

Location:	Willow, Alaska	**Accident Number:**	ANC19LA005
Date & Time:	November 1, 2018, 16:30 Local	**Registration:**	N3227M
Aircraft:	Piper PA 12	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to the pilot, during the initial climb on the personal flight, the engine backfired and then lost total power. He was unable to restore power, and during the subsequent off-airport forced landing, the airplane collided with a stand of trees, which resulted in substantial damage to the wings and fuselage.

A mechanic/friend of the pilot stated that this was the first flight after engine maintenance, during which he and the pilot had been troubleshooting for excessive magneto drops and a cold cylinder. He added that they had just reinstalled the fine wire spark plugs after cleaning them.

A postaccident examination of the airplane revealed that all spark plugs exhibited normal operational signatures with no defects or anomalies noted. Both magnetos produced spark at all terminals as designed. The impulse coupler inside the left magneto was fractured, but that did not preclude the magneto from sparking. Additionally, the wiring harness from the ignition switch to the magnetos was frayed and separated. However, it could not be determined if the separation occurred as a result of the accident. Thus, the reason(s) for the loss of engine power could not be determined.

Probable Cause and Findings

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

The loss of engine power shortly after takeoff for reasons that could not be determined based on the available information, which resulted in an emergency landing and collision with trees.

Findings

Not determined	(general) - Unknown/Not determined
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Collision with terr/obj (non-CFIT)

On November 1, 2018, about 1630 Alaska daylight time, a Piper PA-12 airplane, N3227M, sustained substantial damage during a forced landing, following a total loss of engine power about 8 miles northwest of Willow Airport (PAUO) near Willow, Alaska. The airplane was registered to and operated by the pilot as a 14 *Code of Federal Regulations* (CFR) Part 91 visual flight rules flight when the accident occurred. The commercial pilot sustained serious injuries. Visual meteorological conditions prevailed and no flight plan had been filed for the local area flight. The flight had departed a private airstrip located about 1 mile east of the accident location at about 1629.

According to the pilot, during the initial climb, the engine popped three times "like a backfire", and then lost all power. He switched from operating on the left fuel tank to the right fuel tank and applied the carburetor heat, but the engine failed to respond. Subsequently, during the forced landing into trees, the airplane sustained substantial damage to the wings and fuselage.

A friend of the pilot stated that this was the first flight following engine maintenance, where he, an airframe and powerplant mechanic, and the pilot had been troubleshooting for excessive magneto drops and a cold cylinder. He added that, they had just reinstalled the fine wire spark plugs after cleaning them.

The National Transportation Safety Board (NTSB) investigator-in-charge, along with another NTSB investigator conducted a post-accident examination of the airplane following recovery. The spark plugs and rocker arm covers were removed from the engine and all spark plugs exhibited normal operational signatures with no defects or anomalies noted. The crankshaft was rotated by hand and thumb compression and suction were obtained on all four cylinders, and continuity was established throughout the engine and valvetrain.

The wiring from the ignition switch to the magnetos was frayed and separated. It could not be determined if the separation happened before the accident or as a result of the accident. Both magnetos were removed from the engine and tested at Alaskan Aircraft Engines in Anchorage, Alaska. Both magnetos produced spark at all terminals as designed. Neither distributor was fractured, however the impulse coupler inside the left magneto was fractured but that did not preclude the magneto from sparking.

The ignition harness was removed from the airplane and sent to Continental Motors for testing. The ignition switch was connected to a magneto synchronizer box (Model E50). The key was rotated through the OFF, L, R, and BOTH positions of the ignition switch with normal function observed.

Pilot Information

Certificate:	Airline transport	**Age:**	50,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Front
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	July 1, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 28, 2018
Flight Time:	2838.8 hours (Total, all aircraft), 51.4 hours (Total, this make and model), 2766.3 hours (Pilot In Command, all aircraft), 40.5 hours (Last 90 days, all aircraft), 11.6 hours (Last 30 days, all aircraft), 1.2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3227M
Model/Series:	PA 12	**Aircraft Category:**	Airplane
Year of Manufacture:	1947	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	12-2108
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	May 20, 2018 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	53 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3738.83 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, not activated	**Engine Model/Series:**	O-320 SERIES
Registered Owner:		**Rated Power:**	150 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:	PAWS,354 ft msl	**Distance from Accident Site:**	24 Nautical Miles
Observation Time:		**Direction from Accident Site:**	136°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.73 inches Hg	**Temperature/Dew Point:**	-7°C / -11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Willow, AK (UUO)	**Type of Flight Plan Filed:**	None
Destination:	Willow, AK (UUO)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	WILLOW UUO	**Runway Surface Type:**	
Airport Elevation:	215 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	61.859443,-150.126113(est)

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	James Grogan; FAA; Wasilla, AK Mark Platt; Lycoming Engines; Williamsport, PA
Original Publish Date:	June 29, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98596