Aviation Investigation Final Report

Location:	Portland, Indiana	**Accident Number:**	CEN17LA205
Date & Time:	May 26, 2017, 17:20 Local	**Registration:**	N604KA
Aircraft:	AMSTUTZ CURTIS J BD-5B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Flight test		

Analysis

The private pilot, who was the builder of the airplane, stated that the purpose of the test flight was to obtain rate of climb data on the airplane, which had recently been completed. Following the sixth climb of the flight, the engine began to run rough. The pilot turned back toward the airport and entered the traffic pattern, and the engine experienced a total loss of power. The pilot determined that the airplane would not reach the runway and performed an off-airport landing in a field. The field was soft and contained high vegetation, which resulted in a ground loop during landing.

The pilot noted that, during the flight, the No. 1 cylinder exhaust gas temperature and cylinder head temperature had dropped, indicating that the No. 1 cylinder was not firing properly. It was after the No. 1 cylinder quit firing that the No. 2 cylinder also quit firing. A postaccident examination of the engine revealed that the wire in the No. 1 cylinder connector between the engine control unit and the fuel injector was not properly crimped at the connector, which allowed the wire to be pulled back. In addition, a wire to the No. 2 connector was found broken where the wire had been spliced. This wire most likely separated at the spliced area due to engine vibrations after the No. 1 cylinder ceased operating.

Probable Cause and Findings

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

A failure of the wiring between the engine control unit and the fuel injector, which resulted in a total loss of engine power.

Findings

Aircraft	Electrical pwr sys wiring - Failure
Environmental issues	Wet/muddy terrain - Contributed to outcome

Factual Information

History of Flight

Maneuvering	Loss of engine power (partial)
Approach-VFR pattern base	Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing
Landing-landing roll	Landing gear collapse

On May 26, 2017, at 1720 eastern daylight time, an Amstutz BD-5B amateur built airplane, N604KA, was involved in an off airport forced landing, following a loss of engine power in Portland, Indiana. The pilot was not injured. The airplane was substantially damaged. The airplane was registered to and operated by an individual under the provisions of 14 *Code of Federal Regulations* Part 91 as an engineering test flight. Visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The local flight originated from the Portland Municipal Airport (PLD), Portland, Indiana, at 1650.

The pilot reported the airplane had 5.8 flight hours since he completed building it and the purpose of the flight was to obtain rate of climb data. Following the 6th climb, while at an altitude of 3,500 ft above mean seal level, the engine began to run rough. The pilot entered a left downwind at PLD and descended for a landing approach. The pilot reported he switched fuel tanks and performed a magneto check, neither of which corrected the engine roughness. The pilot noticed the cylinder head temperature and the exhaust gas temperature for the No. 1 cylinder decreased, indicating the No. 1 cylinder was not firing. As he turned onto base leg, the engine lost all power. The pilot realized he was not going to be able to make it to the runway, so he selected a field in which to land. The field contained 3 ft tall vegetation and was soft from recent rain. About 170 ft into the landing roll, the landing gear collapsed, and the airplane ground looped which resulted in damage to the flaps, ailerons, and horizontal stabilator.

The airplane was equipped with a 2-cycle, 2-cylinder Hirth 3203E engine. A postaccident inspection of the engine by the pilot revealed there were separated wires in the connectors between the engine control unit (ECU) and the fuel injectors for both the No. 1 and No. 2 cylinders. The wires for the No. 1 cylinder connector appeared to be crimped properly with the insulation reaching the crimped connector. The pilot tugged on the wire and about 1/2 inch of the copper wire came out of the insulation. The pilot removed the connector for the No. 2 cylinder and found a broken wire at the splice connector that he had installed the month prior to the accident.

The pilot stated that the engine was about 15 years old, even though the engine had 15 hours of total operating time. It is unknown when the No. 1 cylinder connector was installed on the engine.

Pilot Information

Certificate:	Private	**Age:**	48,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	March 21, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	212 hours (Total, all aircraft), 6 hours (Total, this make and model), 183 hours (Pilot In Command, all aircraft), 2 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AMSTUTZ CURTIS J	**Registration:**	N604KA
Model/Series:	BD-5B	**Aircraft Category:**	Airplane
Year of Manufacture:	2016	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	1
Landing Gear Type:	Retractable - Tricycle	**Seats:**	1
Date/Type of Last Inspection:	September 26, 2016 Condition	**Certified Max Gross Wt.:**	800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5.8 Hrs	**Engine Manufacturer:**	Hirth
ELT:	Not installed	**Engine Model/Series:**	3203E
Registered Owner:	On file	**Rated Power:**	65 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:	PLD,925 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	16:30 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:	Scattered / 7000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.84 inches Hg	**Temperature/Dew Point:**	24°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Portland, IN (PLD)	**Type of Flight Plan Filed:**	None
Destination:	Portland, IN (PLD)	**Type of Clearance:**	None
Departure Time:	16:50 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Portland Municipal PLD	**Runway Surface Type:**	
Airport Elevation:	925 ft msl	**Runway Surface Condition:**	Wet
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	40.451946,-84.979721(est)

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	Louis Soto; FAA; Indianapolis, IN
Original Publish Date:	November 15, 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=95270