Aviation Investigation Final Report

Location:	Indiana, Pennsylvania	**Accident Number:**	ERA18LA242
Date & Time:	September 2, 2018, 09:20 Local	**Registration:**	N4059C
Aircraft:	Stinson 108	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The student pilot and instructor departed on a local instructional flight, completing about 35 minutes of airwork before returning to the airport to practice takeoffs and landings. They performed several landings and used full carburetor heat during each approach. During the initial climb for the last takeoff, the engine response was "normal" until about 300 ft above ground level, when the engine "abruptly" lost total power. The flight instructor took the flight controls, attempted to restore engine power, and turned the airplane toward a clearing, where it impacted trees before impacting the ground.

Fuel samples from the wings, gascolator, and carburetor revealed solid debris similar to dirt and orange sealant in all samples. Additionally, an air filter element was found lodged in the carburetor venturi. Because the airplane had flown for a few hours since maintenance was completed and the engine stopped producing power "abruptly," it is likely that the engine was starved of fuel as a result of the debris that migrated through the fuel system, which resulted in the total loss of engine power.

Probable Cause and Findings

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

A total loss of engine power as a result of debris contamination of the fuel, which resulted in fuel starvation.

Findings

Aircraft	Fuel - Fluid condition
Aircraft	Fuel - Not serviced/maintained

Factual Information

History of Flight

Initial climb	Fuel contamination (Defining event)
Emergency descent	Controlled flight into terr/obj (CFIT)

On September 2, 2018, about 0920 eastern daylight time, a Stinson 108, N4059C, was substantially damaged during a forced landing near Indiana County Airport (IDI), Indiana, Pennsylvania. The student pilot incurred serious injuries and the flight instructor was incurred minor injuries. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight, which originated around 0800. The instructional flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to the flight instructor, the student pilot performed a preflight inspection of the airplane, which included sampling fuel from the fuel tanks, with no anomalies noted. In addition, there was about 12.5 gallons of fuel in each tank, totaling 25 gallons. They departed the airport and used the right fuel tank for the beginning of the flight and switched to the left tank after about 35 minutes of air work outside the airport traffic pattern. They returned to the traffic pattern and performed about 5 landings and used full carburetor heat during each approach. During the initial climb of the last take off, the engine response was "normal" until about 300 ft above ground level. At that time, the engine "abruptly" lost total power. The flight instructor took the flight controls, pitched the airplane to maintain airspeed, and attempted to regain engine power. He turned the airplane toward a clearing, and the airplane struck trees prior to impacting the ground.

The airplane came to rest upright in high brush. The forward section of the fuselage was substantially damaged. Initial examination of the engine by a Federal Aviation Administration (FAA) inspector revealed that the engine mount was fractured in three places and there were no holes in the crankcase. In addition, crankshaft continuity was confirmed from the propeller hub to the accessory section of the engine. The magnetos produced spark on all towers. A fuel sample was taken from the wings and solid debris was noted in the fuel. In addition, fuel was noted in the gascolator and debris was noted in the sample. Fuel was drained from the wings and debris was noted. The debris was similar to dirt and orange sealant. The carburetor was removed from the engine and disassembled. There was an air filter element lodged in the throat of the carburetor venturi. In addition, there was debris in the fuel inside the carburetor bowl and in the carburetor fuel inlet screen.

According to the FAA inspector, the owner had the airplane for about 2 and a half years. In that time, it had flown about 20 hours. Between August 2016 and August 2018, the airplane engine had all new cylinders installed and the wings recovered. The most recent annual inspection was completed on May 24, 2018, at a total time of 2493.8 hours. On the day of the accident the airplane had accumulated 2,498 total hours.

In a conversation with the student pilot, he stated that there was no fuel contamination noted from the fuel storage tanks at the airport around the time of the accident.

Student pilot Information

Certificate:	Student	**Age:**	63,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	May 13, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	26.2 hours (Total, all aircraft), 18.8 hours (Total, this make and model), 0.8 hours (Last 90 days, all aircraft)		

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	52,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2	**Last FAA Medical Exam:**	June 1, 2018
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	1865 hours (Total, all aircraft), 20 hours (Total, this make and model), 50 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Stinson	**Registration:**	N4059C
Model/Series:	108 3	**Aircraft Category:**	Airplane
Year of Manufacture:	1949	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	108-5059
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	May 24, 2018 Annual	**Certified Max Gross Wt.:**	2401 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2498 Hrs at time of accident	**Engine Manufacturer:**	Franklin
ELT:	Installed, not activated	**Engine Model/Series:**	6A4-165-B3
Registered Owner:		**Rated Power:**	165 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:	IDI,1405 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	09:15 Local	**Direction from Accident Site:**	86°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 3800 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.31 inches Hg	**Temperature/Dew Point:**	23°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Indiana, PA (IDI)	**Type of Flight Plan Filed:**	None
Destination:	Indiana, PA (IDI)	**Type of Clearance:**	None
Departure Time:	08:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Indiana County/Jimmy Stewart F IDI	**Runway Surface Type:**	Asphalt
Airport Elevation:	1419 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	29	**IFR Approach:**	None
Runway Length/Width:	5502 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	40.635833,-79.110557(est)

Administrative Information

Investigator In Charge (IIC):	Kemner, Heidi		
Additional Participating Persons:	Dean Glasser; FAA/FSDO; Allegheny, PA		
Original Publish Date:	December 3, 2020	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98222		