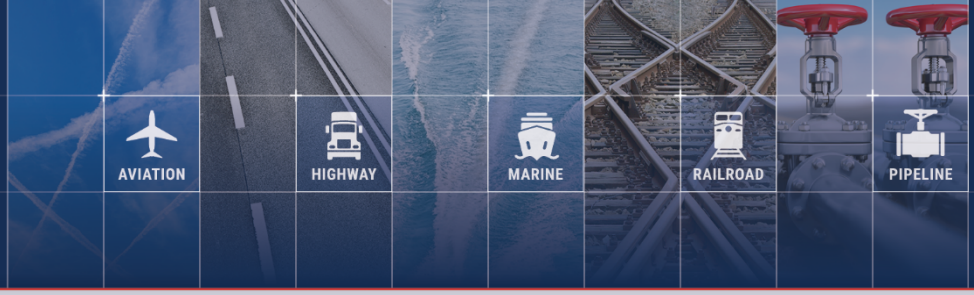

Aviation Investigation Final Report

Location:	Hanover Park, Illinois	**Accident Number:**	CEN18LA181
Date & Time:	May 18, 2018, 20:32 Local	**Registration:**	N667AZ
Aircraft:	Vans RV7A	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a personal cross-country flight when the airplane had a partial loss of engine power shortly after takeoff. Engine operation did not improve after the pilot's corrective actions and a forced landing was completed to a soft field where the airplane nosed over upon touchdown. The fuselage, both wings, and the empennage were substantially damaged during the accident.

Postaccident fuel samples taken from each wing tank sump did not exhibit any contamination. A fuel sample collected from the fuel supply line connected to the fuel injector servo inlet contained a small amount water contamination. The electric fuel pump was used to obtain an additional fuel sample, which also contained water contamination. The fuel filter, which was not equipped with a drain sump, had evidence of water contamination. Besides the water contamination found in the fuel system, the postaccident examination did not reveal any anomalies that would have precluded normal engine operation during the flight.

The pilot reported that the fuel samples he obtained from each wing tank sump during his preflight inspection were not contaminated. The pilot would have been unable to identify water contamination downstream of the fuel tanks, because the experimental airplane was not equipped with a drainable fuel filter. A review of maintenance documentation revealed at least one instance of water and particulate contamination being found in the fuel filter and the fuel injection servo finger screen. Based on the available evidence, it is likely that the partial loss of engine power shortly after takeoff was due to water contamination of the fuel system.

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 shortly after takeoff due to water contamination of the fuel system.

Findings

Aircraft	Fuel - Fluid condition

Factual Information

History of Flight

Enroute-cruise	Fuel contamination (Defining event)
Landing	Off-field or emergency landing
Landing-flare/touchdown	Nose over/nose down

On May 18, 2018, about 2032 central daylight time, an experimental Vans RV7A airplane, N667AZ, was substantially damaged when it was involved in an accident near Hanover Park, Illinois. The airline transport pilot sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that he completed a normal preflight inspection that revealed no anomalies with the airplane or its engine. The pilot noted that both wing fuel tanks were completely full before the flight, and he did not observe any contamination in the fuel samples that he obtained from each wing tank during his preflight. The airplane was not equipped with a drainable fuel filter assembly. The pilot reported that the engine started without hesitation and that there were no anomalies during the before-takeoff engine runup. The pilot performed a normal takeoff from runway 11 and entered a left downwind to depart from the airport traffic pattern. As the airplane climbed through 1,600 ft mean sea level, the engine began to run rough and one of the cylinders had an elevated exhaust gas temperature. The pilot stated that he turned on the fuel boost pump, switched fuel tanks, and ensured that the throttle, mixture, and propeller controls were full forward. The engine operation did not improve despite the pilot's corrective actions and the airplane was unable to maintain altitude. The pilot initially began a turn back toward the airport, but decided to maneuver toward a nearby vacant field to remain clear of a densely populated area. The pilot stated that the airplane nosed over upon touchdown on the soft field, and the pilot was able to exit the airplane with minor injuries.

A postaccident examination of the airplane and its engine was completed by a National Transportation Safety Board investigator and a Federal Aviation Administration airworthiness inspector. The fuselage, both wings, and the empennage were substantially damaged during the accident. The airplane was equipped with only two fuel sumps, one located under each wing; the fuel filter did not have a sump. Fuel samples taken from each wing tank sump were free of water contamination. A sample collected from the fuel supply line connected to the fuel injector servo inlet contained a mixture of 100 low-lead aviation fuel and a small amount of water. The electric fuel pump was used to obtain an additional fuel sample, which also contained water. The fuel filter was removed from the fuselage and its contents drained; water detection paste revealed the presence of water. Water was also

detected in the filter screen. Examination did not reveal any mechanical anomalies that would have precluded normal engine operation during the flight.

A review of maintenance documentation revealed that, on February 20, 2017, water and particulate contamination were observed in the fuel filter and the fuel injection servo finger screen during a routine condition inspection. The final airframe logbook entry, dated March 27, 2018, did not indicate if any water or particulate contamination was observed during a routine condition inspection; however, the logbook entry did note that the fuel filter and fuel injector servo finger screen were removed and cleaned. At the time of the accident, the airplane had flown 4.6 hours since the last condition inspection.

Pilot Information

Certificate:	Airline transport; Flight engineer	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	April 6, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 14, 2018
Flight Time:	11766 hours (Total, all aircraft), 438 hours (Total, this make and model), 3400 hours (Pilot In Command, all aircraft), 218 hours (Last 90 days, all aircraft), 86 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Vans	**Registration:**	N667AZ
Model/Series:	RV7A	**Aircraft Category:**	Airplane
Year of Manufacture:	2006	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	70683
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	March 27, 2018 Condition	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:	4.6 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	792.2 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-360-GNX
Registered Owner:		**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	06C,801 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	20:35 Local	**Direction from Accident Site:**	102°
Lowest Cloud Condition:		**Visibility**	4 miles
Lowest Ceiling:	Overcast / 300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	14°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Schaumburg, IL (06C)	**Type of Flight Plan Filed:**	None
Destination:	Terre Haute, IN (HUF)	**Type of Clearance:**	None
Departure Time:	20:29 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Schaumburg Regional Airport 06C	**Runway Surface Type:**	Concrete
Airport Elevation:	801 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	11	**IFR Approach:**	None
Runway Length/Width:	3800 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	41.994445,-88.135276

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew		
Additional Participating Persons:	Victor Liberatore; Federal Aviation Administration - DuPage FSDO; Des Plaines, IL		
Original Publish Date:	May 25, 2021	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97279		