



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Princeton, New Jersey	Accident Number:	NYC08LA107
Date & Time:	February 21, 2008, 11:48 Local	Registration:	N159AS
Aircraft:	Christer Vans RV9-A	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Serious, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Prior to the accident flight, the airplane had accumulated about 1 flight hour since the pilot completed the installation of a new aftermarket fuel injection and ignition system. Shortly after takeoff on the accident flight, as the pilot turned onto the crosswind leg of the traffic pattern, the engine lost power, and the propeller "stopped." The pilot added that he believed the electrical system was functioning at the time because the electronic flight instrument system and the communication radio continued to function. The pilot subsequently performed a forced landing into the dense forest below. Although the wreckage was fire-damaged during the recovery process, examination of the engine revealed that while the pilot had installed a new after market fuel injection/ignition system, an original-equipment diode bridge remained in place. The diode bridge provided dual electrical paths to the engine control unit, thereby providing electrical power to the ignition system. The original ignition system, for which the diode bridge was designed, drew between 4 and 6 amperes for operation, while the aftermarket system drew between 8 and 12 amperes. The only manifestation of a failure of the diode bridge would be on engine operation; the remainder of the electrical system would continue to function normally.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to the pilot/owner's improper installation of a new ignition/fuel control system for the engine. Contributing was the unsuitable terrain for a forced landing.

Findings

Aircraft	(general) - Failure
Personnel issues	Installation - Owner/builder
Environmental issues	Tree(s) - Not specified
Environmental issues	(general) - Not specified

Factual Information

History of Flight

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

On February 21, 2008, at 1148 eastern standard time, an amateur-built Vans RV-9A, N159AS, was substantially damaged when it impacted trees and terrain shortly after takeoff from Princeton Airport (39N), Princeton, New Jersey. The certificated commercial pilot was seriously injured and the passenger was not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local personal flight, which was conducted under 14 Code of Federal Regulations (CFR) Part 91.

In a written statement, the pilot stated that shortly after takeoff, as he turned onto the crosswind leg of the traffic pattern, the engine lost power, and the propeller "stopped." The pilot had already activated both fuel pumps and the dual ignition switches for takeoff, so there were no additional emergency switches to actuate. Additionally, the electrical system "seemed solid," since the electronic flight instrument system and communication radios were still functioning. There was no suitable landing area within gliding range, and the airplane was substantially damaged during the forced landing in a dense forest.

The pilot also stated that the airplane had accumulated about 1 flight hour since he had performed some work on the airplane's engine and propeller reduction gearbox.

According to a Federal Aviation Administration (FAA) inspector at the scene, he noted the presence of fuel which had leaked from the airplane's fuel tanks. During the recovery process, some of the leaked fuel ignited, partially burning the wreckage. The fire was subsequently extinguished, and the wreckage was transported to the airport.

Two representatives of the engine manufacturer, under the supervision of an FAA inspector, examined the engine on March 4, 2008. According to the representatives, continuity of the engine was confirmed from the rear pulley to the propeller, and compression was confirmed on all six cylinders. The wiring and other components of the electronic ignition system were heavily fire-damaged.

The FAA inspector and engine manufacturer representatives additionally stated that the pilot/owner recently installed a new aftermarket fuel injection/ignition system. Per the aftermarket schematic, the pilot retained an original-equipment diode bridge to provide dual electrical paths to the engine control unit (ECU), and wired it in accordance with the schematic. However, the original ignition system drew between 4 and 6 amperes for operation, while the aftermarket system drew between 8 and 12 amperes. The only manifestation of a failure of the

diode bridge would be on engine operation; the remainder of the electrical system would continue to function normally.

The 1153 weather conditions reported at Trenton Mercer Airport (TTN), Trenton, New Jersey, located about 10 nautical miles southwest of the accident site, included winds from 310 degrees at 6 knots, clear skies, temperature of -2 degrees Celsius (C), dewpoint -15 degrees C, and an altimeter setting of 30.41 inches of mercury.

Pilot Information

Certificate:	Private	Age:	59, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	June 1, 2007
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	300 hours (Total, all aircraft), 60 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Christer	Registration:	N159AS
Model/Series:	Vans RV9-A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	9095
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	June 1, 2007 Annual	Certified Max Gross Wt.:	2000 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	60 Hrs at time of accident	Engine Manufacturer:	Eggenfellner
ELT:	Installed	Engine Model/Series:	H-6
Registered Owner:	On file	Rated Power:	200 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:	TTN,213 ft msl	Distance from Accident Site:	10 Nautical Miles
Observation Time:	11:53 Local	Direction from Accident Site:	230°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	310°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.4 inches Hg	Temperature/Dew Point:	-2°C / -15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Princeton, NJ (39N)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:		Type of Airspace:	

Airport Information

Airport:	Princeton Airport 39N	Runway Surface Type:	
Airport Elevation:	128 ft msl	Runway Surface Condition:	
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:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 None	Latitude, Longitude:	40.399166,-74.658889

Administrative Information

Investigator In Charge (IIC): Diaz, Dennis

Additional Participating Persons: William H Rush; FAA/FSDO; Allentown, PA

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Last Revision Date:

Investigation Class: [Class](#)

Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=67556>

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