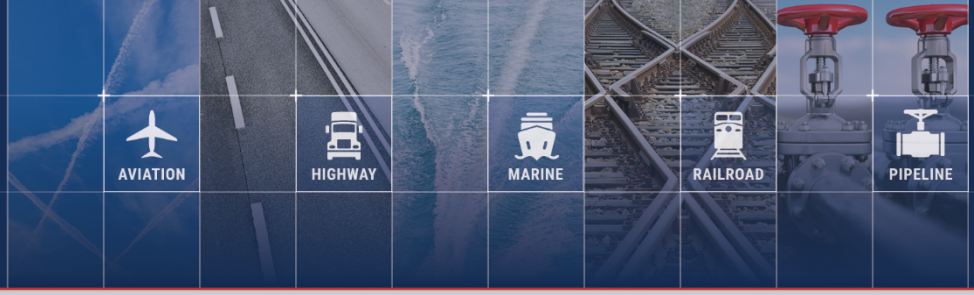

Aviation Investigation Final Report

Location:	Oxford, Ohio	**Accident Number:**	NYC02LA182
Date & Time:	September 5, 2002, 21:37 Local	**Registration:**	N945D
Aircraft:	Duffy Vans RV-9A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During a night flight, the airplane lost total engine power shortly after departure, about 15 miles from the airport. The pilot initially elected to divert to another airport 3 miles away and 2,500 feet below; however, he subsequently decided to land on a road after not being able to see the runway lights. During the landing, the airplane bounced five or six times, struck a sign, veered off the road and nosed over. The pilot had replaced the fuel gauge about 1 week prior to the accident. He had difficulty calibrating the new fuel gauge, and received assistance telephonically from the manufacturer during the calibration. The pilot believed that he had taken off with about 1/2 tank of fuel onboard. An examination of the airplane after the accident revealed that the fuel tanks were empty; however, the fuel gauge indicated 8 gallons. The source of the fuel inaccuracy was undetermined. The airplane had accumulated 11.4 hours of flight time since installation of the fuel gauge. The pilot filled the fuel tanks at 47.0 flight hours, and lost total engine power at 50.9 flight hours. A "must read" notice in the fuel gauge operating manual stated: "Do not solely rely on the FL-2 to determine the fuel level in the fuel tanks."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper fuel calculations, which resulted in fuel exhaustion and a subsequent total loss of engine power. Factors included an inaccurate fuel gauge indication for undetermined reasons, the pilot's reliance on that indication, the night lighting conditions, and a sign alongside the forced landing road.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: CRUISE

Findings
1. FLUID,FUEL - EXHAUSTION
2. (C) FUEL CONSUMPTION CALCULATIONS - IMPROPER - PILOT IN COMMAND
3. (F) ENGINE INSTRUMENTS,FUEL QUANTITY GAGE - INACCURATE
4. (F) EQUIPMENT,OTHER - IMPROPER USE OF - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: EMERGENCY LANDING

Findings
5. TERRAIN CONDITION - ROADWAY/HIGHWAY
6. (F) LIGHT CONDITION - NIGHT
7. (F) OBJECT - SIGN

Occurrence #4: NOSE OVER
Phase of Operation: EMERGENCY LANDING

Findings
8. TERRAIN CONDITION - CROP

Factual Information

On September 5, 2002, at 2137 eastern daylight time, a homebuilt Vans RV-9A, N945D, was substantially damaged during a forced landing in Oxford, Ohio. The certificated private pilot-builder and his pilot-rated passenger received minor injuries. Night visual meteorological conditions prevailed at the time. No flight plan had been filed for the local flight, which originated at Hamilton Airport (HAO), Hamilton, Ohio. The personal flight was conducted under 14 CFR Part 91.

According to the pilot, he departed Hamilton about 2130, and climbed the airplane to 3,500 feet, heading east. Approximately 15 miles from the airport, the engine sputtered. The pilot switched to the left fuel tank and turned on the fuel boost pump. Engine power resumed for about 5 minutes, then the engine quit.

According to the pilot's GPS, Miami University Airport (OXD), Oxford, Ohio, was the closest airport [elevation 1,045 feet], about 3 miles away. The pilot keyed the microphone on frequency 122.8, and attempted to turn on the runway lights; however, the airport remained "black dark." The pilot spotted the airport beacon and red lights, but could not determine the "direction of runway."

The pilot then alerted air traffic control personnel of his problem. He subsequently spotted a house and few cars on a road. He saw a separation between cars, and decided to follow one of them to a landing on the road. He landed, missing a tree in the process, then hit a sign after five or six bounces. The airplane veered off the road, to the right, and entered a soybean field where it nosed over.

After the accident, the pilot stated that he had run out of fuel, and a subsequent examination of the airplane confirmed the absence of fuel.

The fuel gauge had been replaced with an Electronics International FL-2CA gauge on August 27, 2002, and the airplane had accumulated 11.4 hours of operating time since its installation. The pilot had difficulty calibrating the gauge, so he contacted the manufacturer for assistance. While on the telephone with a representative of the manufacturer, he had had a fuel truck at the airplane, and was emptying and filling the tanks at varying stages of the calibration, based on the representative's directions. During the calibration, the fuel gauge calibration points kept dropping out of the gauge's memory.

The pilot filled the fuel tanks at 47.0 hours on the Hobbs meter, and it the engine quit at 50.9 hours. The pilot subsequently stated that he thought he had departed with about 1/2 tank of fuel, and the flight was planned for 1 hour. The fuel gauge indicated 8 gallons after the fuel had been exhausted, and the pilot was not sure if the problem was with a faulty gauge, the

calibration procedures, or the capacitance probes.

A "must read" notice in the fuel gauge operating and instructions manual stated: "Do not solely rely on the FL-2 to determine the fuel level in the fuel tanks."

Pilot Information

Certificate:	Private	**Age:**	48,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	June 2, 2002
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	June 29, 2002
Flight Time:	346 hours (Total, all aircraft), 52 hours (Last 90 days, all aircraft), 19 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Duffy	**Registration:**	N945D
Model/Series:	Vans RV-9A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	90011
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	July 10, 2002 Condition	**Certified Max Gross Wt.:**	1750 lbs
Time Since Last Inspection:	50.9 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	50.9 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	O-320
Registered Owner:	William J. Duffy	**Rated Power:**	160 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	CVG,897 ft msl	**Distance from Accident Site:**	55 Nautical Miles
Observation Time:	20:51 Local	**Direction from Accident Site:**	170°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	26°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Oxford, OH (OXD)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	21:30 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	39.5,-84.783332

Administrative Information

Investigator In Charge (IIC):	Cox, Paul
Additional Participating Persons:	Leon Awalt; FAA/FSDO; Cininnati, OH
Original Publish Date:	March 2, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55638