



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Bermuda Dunes, California	<b>Accident Number:</b>	WPR22LA061
<b>Date &amp; Time:</b>	December 11, 2021, 12:30 Local	<b>Registration:</b>	N9YY
<b>Aircraft:</b>	MOUL WILLIS RV-3	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Aerodynamic stall/spin	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot departed on a local flight in the experimental, amateur-built airplane. Flight track information indicated that the airplane departed and climbed to a maximum altitude of about 712 ft above ground level. One witness saw the airplane and described the engine noise as loud. As the airplane turned toward her location, she saw that the propeller blades were spinning slower than she thought they should. Another witness, who was closer to the accident site, saw the airplane at low altitude but could not hear the engine noise. A third witness captured video showing the airplane first in level flight, then its pitch attitude increased, and the airplane entered a right bank. The right bank continued past 90° as the airplane entered a nose-low descent.

The airplane impacted a palm tree about 35 ft agl about 3 minutes after takeoff and came to rest upright in the driveway of a private residence. Examination of the airframe and engine revealed no mechanical anomalies that would have precluded normal operation; however, the fuel shutoff valve was found in an intermediate position that restricted fuel flow about 50%. Based on the available information, it is likely that the pilot's improper positioning of the fuel shutoff valve resulted in fuel starvation and a total loss of engine power during the takeoff climb as evidenced by the absence of engine noise in the witness video. The pilot subsequently exceeded the airplane's critical angle of attack, resulting in an aerodynamic stall/spin and loss of control.

## Probable Cause and Findings

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

The pilot's improper positioning of the fuel shutoff valve, which resulted in a loss of engine power, and the pilot's subsequent exceedance of the airplane's critical angle of attack, resulting in an aerodynamic stall and loss of control.

## Findings

<b>Aircraft</b>	Fuel selector/shutoff valve - Incorrect use/operation
<b>Aircraft</b>	Airspeed - Not attained/maintained
<b>Aircraft</b>	Angle of attack - Capability exceeded
<b>Personnel issues</b>	Aircraft control - Pilot

# Factual Information

## History of Flight

Enroute-climb to cruise	Fuel starvation
Emergency descent	Off-field or emergency landing
Emergency descent	Aerodynamic stall/spin (Defining event)
Emergency descent	Loss of control in flight
Emergency descent	Collision with terr/obj (non-CFIT)

On December 11, 2021, about 1230 Pacific standard time, an experimental, amateur-built RV-3 airplane, N9YY, was substantially damaged when it was involved in an accident near Bermuda Dunes, California. The pilot was fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

According to a friend who had spoken to the pilot’s wife after the accident, the pilot planned a local flight, with the intention to overfly his home, located about 2.7 miles southwest of Bermuda Dunes Airport (UDD), Palm Springs, California.

A security camera located at UDD, captured the airplane as it lifted off at 1226:17 and flew out of view. Automatic dependent surveillance-broadcast (ADS-B) data provided by the Federal Aviation Administration (FAA) revealed that, at 1226:55 the airplane was about .6 miles southwest of UDD at an altitude of 517 ft above ground level (agl), and on a heading consistent with a track toward the pilot’s residence. The airplane overflowed a portion of the city of Bermuda Dunes, California. The airplane maintained the southeast heading for about 1.3 miles. At 1227:22, the airplane overflowed a 300-ft-by-900 ft vacant lot. About 10 seconds later, the airplane had reached a maximum altitude of 712 ft agl. Nine seconds later, it had descended to 672 ft agl and began a right turn. The airplane continued the descending right turn until the end of the track data, at 1228:22. At that time, the airplane was on a heading of 124° at a low altitude, about 525 ft north of the accident site, as shown in figure 1. The accident site was immediately north of the vacant lot the airplane had previously overflowed.

Multiple witnesses saw the airplane in flight. One witness, located about .7 miles west of the accident site, reported that she first heard a loud airplane, then saw it in a descending right turn. She could see the individual propeller blades spinning but not as fast as she thought they should be. Another witness, located about 1,500 ft north of the accident site, reported that he saw the airplane in a normal attitude travelling from north to south at a very low altitude. He could not hear the engine. Another witness, located about 1,000 ft north of the accident site, captured a 10-second video of the airplane just before the accident. The video revealed the airplane in a near-level pitch attitude and traveling to the southeast. No engine noise from the

airplane was heard. The airplane's pitch attitude increased, and the airplane entered a right bank. The last moments of the video revealed the airplane in a right bank angle exceeding 90° as the nose dropped.

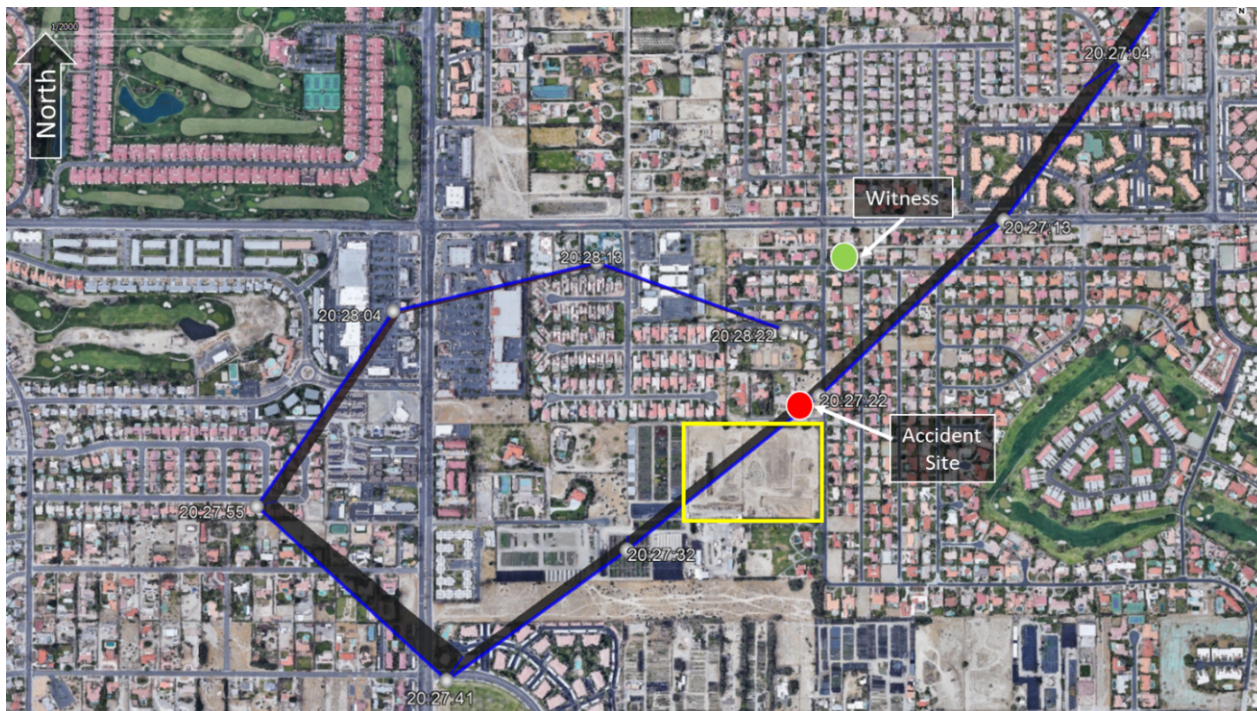


Figure 1. Overhead view of the ADS-B flight track. A vacant lot is identified by a yellow border.

The airplane came to rest upright on a residential driveway about 1.3 miles southwest of UDD. The first point of impact was a palm tree about 35 ft in height located about 50 ft north of the wreckage. The top portion of the palm tree lay adjacent to the airplane and one of the airplane's wooden propeller blades was located at the base of the tree. All major structural components remained attached to the airplane and flight control continuity was established to all flight control surfaces. The forward engine cowling area exhibited crush damage with embedded palm fronds. There was crush damage of the fuselage, aft of the firewall, that extended to the cockpit area. The right wing exhibited substantial damage to the leading edge. The left wing exhibited substantial damage to the leading edge near the root. The empennage exhibited only minor damage.

Postaccident examination revealed a fuel shutoff valve mounted to the underside of the breached fuel tank. The fuel shutoff valve handle had no markings to identify an open or closed position, and it was positioned 90° to the fuel line. (see figure 2). The valve was disassembled and examined. When viewed through the fuel passage, and the valve handle was set at 90° to the fuel line; the fuel passage was open about 50%. When the handle was moved aft to the 135° position; the fuel flow was shut off. When the handle was pushed forward to the 45° position, the fuel passage was open 100%. According to a first responder, he did not see anyone manipulate the fuel shutoff valve following the accident. He reported that, by the time



they arrived, all the fuel had drained from the fuel tank, and no one was worried about closing a fuel shutoff valve. According to recovery personnel, about 8 gallons of fuel drained out of the tank after the accident.

Postaccident examination of the airframe and engine revealed no mechanical malfunctions or failures that would have precluded normal operation.

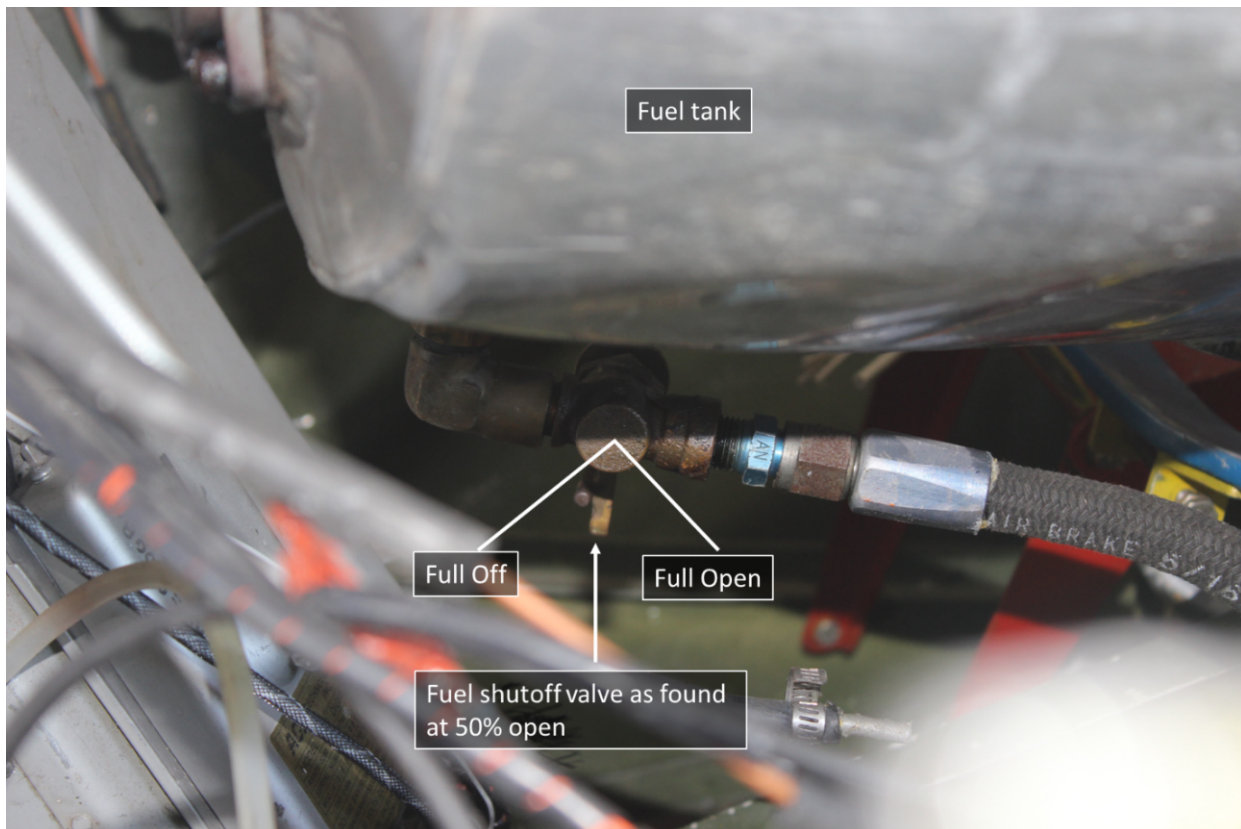


Figure 2. Image of the fuel shutoff valve as found at the accident site.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	83,Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Single
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	BasicMed	<b>Last FAA Medical Exam:</b>	October 7, 2019
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	5000 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	MOUL WILLIS	<b>Registration:</b>	N9YY
<b>Model/Series:</b>	RV-3	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1996	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	11267
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>		<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>		<b>Engine Model/Series:</b>	O-235
<b>Registered Owner:</b>	WALLACE JAMES A	<b>Rated Power:</b>	115 Horsepower
<b>Operator:</b>	WALLACE JAMES A	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	PSP,476 ft msl	<b>Distance from Accident Site:</b>	12 Nautical Miles
<b>Observation Time:</b>	12:53 Local	<b>Direction from Accident Site:</b>	296°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots / None	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	90°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.19 inches Hg	<b>Temperature/Dew Point:</b>	18°C / 0°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Bermuda Dunes, CA (UDD)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Bermuda Dunes, CA (UDD)	<b>Type of Clearance:</b>	Unknown
<b>Departure Time:</b>	11:45 Local	<b>Type of Airspace:</b>	Class G

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	33.740161,-116.29579(est)

## Administrative Information

**Investigator In Charge (IIC):** Salazar, Fabian

**Additional Participating Persons:** Rod Ealy; Federal Aviation Administration; Riverside, CA  
Mark Platt; Lycoming Engines; Phoenix, AZ

**Original Publish Date:** June 8, 2023

**Last Revision Date:**

**Investigation Class:** [Class 3](#)

**Note:** The NTSB did not travel to the scene of this accident.

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=104387>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).