



# Aviation Investigation Final Report

<b>Location:</b>	Gerrardstown, West Virginia	<b>Accident Number:</b>	ERA12LA293
<b>Date &amp; Time:</b>	April 16, 2012, 15:00 Local	<b>Registration:</b>	N5025G
<b>Aircraft:</b>	PRENDERGAST JOHN/VANS RV-7A	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

According to the pilot, after about 2 1/2 hours of local flight, while maneuvering at 3,000 feet, the airplane's rotary engine coolant temperature rose. As the pilot turned the airplane back toward the departure airport, the engine seized and would not turn over during an attempted restart. The pilot performed a forced landing in a field, and the airplane nosed over. The pilot, who was also the airplane's builder, subsequently disassembled the engine and found that the stationary gear/bearing was frozen to the eccentric shaft. The pilot also reported that he had recently attempted to fine tune the engine by having the side and intermediate housings undergo lap grinding. The pilot knew the grinding would require wider spacers, which he used, but which may have still been insufficient in width. The insufficient width resulted in bearing oil hole misalignment on the eccentric shaft, which blocked oil from reaching the rotating engine and reduction drive shaft parts.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot/builder's misjudgment of the required spacer width needed after engine housing lap grinding, which resulted in bearing oil hole misalignment and insufficient internal engine lubrication.

## Findings

<b>Aircraft</b>	(general) - Related maintenance info
<b>Aircraft</b>	Oil - Related maintenance info
<b>Personnel issues</b>	Expectation/assumption - Owner/builder

# Factual Information

## History of Flight

<b>Maneuvering</b>	Loss of engine power (total) (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing
<b>Landing-landing roll</b>	Collision with terr/obj (non-CFIT)
<b>Landing-landing roll</b>	Nose over/nose down

On April 16, 2012, about 1500 eastern daylight time, an experimental amateur-built Van's Aircraft RV-7A, N5025G, was substantially damaged during a forced landing to an agricultural field in Gerrardstown, West Virginia. The commercial pilot was not injured. Visual meteorological conditions prevailed. No flight plan had been filed for the local flight, which originated at Eastern West Virginia Regional Airport/Shepherd Field (MRB), Martinsburg, West Virginia. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to the pilot, the airplane departed MRB about 1230, and during the flight, while maneuvering about 3,000 feet, the Mazda 13B rotary engine's coolant temperature rose. The pilot turned the airplane back toward the airport, and the engine seized and would not turn over during an attempted restart. The pilot advised MRB control tower personnel that he would have to land in a field, which included recently-planted apple trees. The pilot was able to land on a flat portion of the field; however, during the landing rollout, the airplane encountered a ditch that caught the nose wheel and bent the nose strut back, and the airplane nosed over.

After the airplane was recovered from the field, the pilot, who was also the builder, disassembled the engine, which he stated had 4 hours of operation since it was rebuilt. The pilot first noted that the water pump, which was newly installed prior to the accident flight, had rust-colored water at the outlet hole from the pump bearing. The pilot also noted that a lot of metal had passed through the engine and the reduction drive, and that the stationary gear/bearing was frozen to the eccentric shaft.

The pilot/builder further noted that during the recent rebuild, he had attempted to fine tune the engine by having the side and intermediate housings undergo lap grinding. The pilot/builder knew the grinding would require wider spacers, which he used, but those used may have been insufficient in width. The insufficient width resulted in bearing oil hole misalignment on the eccentric shaft which blocked oil from reaching rotating engine and reduction drive shaft parts.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	72, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	April 19, 2010
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	April 19, 2010
<b>Flight Time:</b>	3196 hours (Total, all aircraft), 290 hours (Total, this make and model), 2000 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	PRENDERGAST JOHN/VANS	<b>Registration:</b>	N5025G
<b>Model/Series:</b>	RV-7A	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	71591
<b>Landing Gear Type:</b>		<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	April 19, 2011 Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>	60 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	290 Hrs at time of accident	<b>Engine Manufacturer:</b>	MAZDA
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	13B
<b>Registered Owner:</b>	AIRNAV CORP	<b>Rated Power:</b>	146 Horsepower
<b>Operator:</b>	John Prendergast	<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>	MRB,565 ft msl	<b>Distance from Accident Site:</b>	5 Nautical Miles
<b>Observation Time:</b>	14:53 Local	<b>Direction from Accident Site:</b>	60°
<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>	11 knots / 16 knots	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	170°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.94 inches Hg	<b>Temperature/Dew Point:</b>	31°C / 13°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Martinsburg, WV (MRB )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Martinsburg, WV (MRB )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	12:30 Local	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	39.351665,-78.099723(est)

## Administrative Information

**Investigator In Charge (IIC):** Cox, Paul

**Additional Participating Persons:** David Garey; FAA/FSDO; Baltimore, MD

**Original Publish Date:** January 31, 2013

**Last Revision Date:**

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

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=83441>

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