



# Aviation Investigation Final Report

<b>Location:</b>	MUNCIE, Indiana	<b>Accident Number:</b>	CHI96FA334
<b>Date &amp; Time:</b>	September 17, 1996, 13:55 Local	<b>Registration:</b>	N952JT
<b>Aircraft:</b>	Thocker RV-4	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

Two pilots departed in the amateur built airplane for a local flight. About 10 miles from the departure airport, the airplane was observed to descend into the terrain. The activity of the airplane prior to the accident and/or the individual operating the airplane controls at the time was not determined. Subsequent to the accident an examination of the airplane determined that the carry-through portion of the horizontal stabilizer, which included the forward attachment for the vertical stabilizer, had become disconnected in flight. The particular part was not found. The entire right horizontal stabilizer and the outboard half of the right elevator departed the airplane in-flight. The lower rudder attach fitting bolt was missing at the impact site, and there was no evidence that the bolt was in place at the time of the accident.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: was the in-flight disconnection of the horizontal and vertical stabilizer forward attachments.

## Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION  
Phase of Operation: UNKNOWN

### Findings

1. (C) HORIZONTAL STABILIZER ATTACHMENT - DISCONNECTED
2. (C) VERTICAL STABILIZER ATTACHMENT - DISCONNECTED

3. FLT CONTROL SYST, RUDDER CONTROL ATTACH POINTS - LOOSE PART/BOLT/NUT/CLAMP/ETC  
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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

### HISTORY OF FLIGHT

On September 17, 1996, at 1355 eastern standard time, a Thocker RV-4, N952JT, was destroyed on impact with the terrain, following the in-flight separation of the right horizontal stabilizer. The accident occurred about 10 miles northwest of Muncie, Indiana. The pilot and one pilot rated passenger received fatal injuries. The personal 14 CFR Part 91 flight was operating in visual meteorological conditions. No flight plan was on file for the local flight. The flight departed Muncie, Indiana, at 1345.

Witnesses at the airport said that the two pilots arrived at the Delaware County (Muncie, Indiana) Airport in separate airplanes. One pilot was flying the accident airplane and the other arrived with another airplane owner for lunch at the local restaurant. The two pilots knew one another and the pilot of the accident airplane offered the second pilot a ride in the airplane. The second pilot told his passengers that he was going for a flight and would return in about fifteen minutes. The pilot who flew the airplane into the airport was observed to occupy the front seat and the second pilot the rear seat. The airplane was seen to depart the airport at 1345.

A witness on the ground said she observed the airplane for about one and one-half minutes. She said the airplane, "...dipped the right wing, and then it looked like it was out of control. It spiraled two (or) three times before it hit the ground. I saw no parts fly off the airplane before it hit the ground."

### PERSONAL INFORMATION

The pilot in the front seat was born May 21, 1955. He was the holder of an airline transport pilot's certificate. His most recent FAA medical was conducted on June 19, 1996. On the application for that examination he indicated a total pilot time of 12,668 hours with 284 hours in the preceding six months.

The pilot in the rear seat was born December 9, 1970. He was the holder of a commercial pilot's certificate. His most recent FAA medical was conducted on August 1, 1995. On the application for that examination he indicated a total pilot time of 1,760 hours with 300 hours in the preceding six months.

### AIRCRAFT INFORMATION

The airplane was an amateur build RV-4. The airplane was initially issued a Special Airworthiness Certificate on April 5, 1996. The owner/builder of the airplane stated that the

airplane had accumulated 50 hours time in service, at the time of the accident. The airplane was equipped with an inverted fuel and oil system. According to the weight and balance statement for N952JT, the maximum gross weight was 1,600 pounds; while the maximum gross weight for aerobatic was 1,375 pounds. A copy of the weight and balance statement is attached to this report.

## WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in an open farm field about 10 miles northwest of the departure airport. The exact time of the accident is unknown. The airplane was known to depart at 1345. A witness stated that her recollection of the accident time as 1323. The exact time the airplane was airborne prior to the accident is unknown.

The main wreckage was oriented on a northeast heading and was inverted. An eight inch deep crater was oriented forward of the wreckage. No other evidence of impact were found.

The airframe and engine were located within a few yards of the impact site with the exception of fragments of the canopy and the entire right horizontal stabilizer and outboard half of the right elevator. Fragments of the canopy were found to the south of the impact site to a distance of 100' and the right horizontal stabilizer with the outboard half of the elevator was found at 150' to the south southeast of the impact site. There was no evidence of ground impact damage on the surface of the right horizontal stabilizer or outboard section of the elevator. There was a small amount of dirt adhering to the tip of the stabilizer.

The carry-through structure for the forward horizontal stabilizer which also includes the front attachment for the vertical stabilizer was missing and has not been located. This structure attached the front of the empennage to the tail cone of the airplane structure.

Also missing at the impact site was the lower hinge bolt which attached the rudder to the tailcone. A visual examination of the paint around the lower rudder hinge bolt hole revealed an absence of witness marks. The two upper attach bolts remained attached to the vertical stabilizer.

The vertical stabilizer, rudder, left horizontal stabilizer, left elevator, and the inboard section of the right elevator remained attached to the tailcone through the main (rear) spar of the horizontal stabilizer. The entire empennage which remained with the tailcone showed evidence of impact damage and had various amounts of dirt adhering to the components.

The main wing structure remained intact throughout; however, the main spar was deformed as found at the accident site. There was no fuel found in the airplane; however, there was an fuel odor around the wreckage site. Continuity of the controls was established for both the flight and engine controls.

The engine remained attached to the mounts and firewall with impact damage. There was

more damage to the front right of the engine. The propeller separated from the engine with the propeller flange portion of the crankshaft remaining attached to the propeller hub. Both blades were bent and twisted and there were chordwise scratches on the camber side of the propeller. Partial rotation of the engine established internal rotation and continuity through the accessory case and valve train. Both magnetos were inspected and sparked through all leads when rotated.

#### MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies were conducted on both pilots on September 18, 1996, at the Ball Memorial Hospital, Muncie, Indiana. The post mortem examinations were negative for pathological anomalies other than those from the accident trauma. Toxicological specimens were obtained from both pilots. The results were negative for the pilot who occupied the front seat. The pilot who occupied the back seat had positive indication for volatiles which were attributed to "post mortem ethanol production."

#### TESTS AND RESEARCH

An independent assessment of the horizontal stabilizer and elevator was ordered by the NTSB. The inspection occurred on November 4, 1996 and a copy of Engineering Systems, Inc. Report of that examination is attached to this report.

On February 12, 1997, Van's Aircraft, Inc., conducted a structural test on the empennage of an exemplar RV-4 fuselage. A copy of that test is attached to this report

#### ADDITIONAL INFORMATION

Parties to the investigation were the Federal Aviation Administration, Flight Standards District Office, Indianapolis, Indiana; Lycoming Engine Company, Williamsport, Pennsylvania; and Van's Aircraft, Inc., North Plains, Oregon.

The wreckage was released to a representative of the owner on September 23, 1996.

## Pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	41,Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	Balloon; Glider	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	June 19, 1996
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	12668 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Thocker	<b>Registration:</b>	N952JT
<b>Model/Series:</b>	RV-4 RV-4	<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>	2633
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	April 5, 1996 Unknown	<b>Certified Max Gross Wt.:</b>	1600 lbs
<b>Time Since Last Inspection:</b>	50 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	50 Hrs	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-320-E2D
<b>Registered Owner:</b>	JON THOCKER	<b>Rated Power:</b>	160 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KMI ,937 ft msl	<b>Distance from Accident Site:</b>	10 Nautical Miles
<b>Observation Time:</b>	13:45 Local	<b>Direction from Accident Site:</b>	140°
<b>Lowest Cloud Condition:</b>	Scattered / 4000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	10 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	30°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	(MIE )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>		<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	13:45 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>		<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>		<b>Runway Surface Condition:</b>	
<b>Runway Used:</b>	0	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	40.13047,-85.379661(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Wilson, Stephen
<b>Additional Participating Persons:</b>	DAVID M ENLOW; INDIANAPOLIS , IN DAWN MARIE; INDIANAPOLIS , IN DICK VAN GRUNSVEN; NORTH PLAINS , OR GREGORY A ERIKSON; WILLIAMSPORT , PA
<b>Original Publish Date:</b>	August 29, 1997
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=10110">https://data.nts.gov/Docket?ProjectID=10110</a>

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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](#).