



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Sebastian, FL	<b>Accident Number:</b>	MIA03LA139
<b>Date &amp; Time:</b>	07/01/2003, 1240 EDT	<b>Registration:</b>	N51576
<b>Aircraft:</b>	Samual G. DaSilva Velocity	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Serious, 1 Minor
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The pilot stated that about 10 minutes after takeoff during cruise flight at 1,500 feet with the passenger flying the airplane, the engine briefly "shuddered", and the rpm dropped to 2,000, then to zero. He took the controls and attempted to restore engine power but was unsuccessful. He maneuvered the airplane for a forced landing in a field, and when the flight was approximately 20 feet above ground level he recognized there were drainage ditches in the field. The airplane was landed in the field, and during the landing roll the nose landing gear collapsed after traveling into a ditch. The airplane then slid into a second ditch, and came to rest approximately 158 feet from the first ditch impact location. Examination of the engine revealed the crankshaft was fractured at the No. 3 cylinder connecting rod journal; there was no evidence of lack of lubrication or fretting on the faying surfaces of the crankcase halves. Metallurgical examination of the crankshaft revealed the fracture surface was located in the aft radius of the No. 3 connecting rod journal; fatigue progression was noted to initiate from the intersection of the radius and the journal. The fracture propagated in a plane perpendicular to the journal surface from a single origin. The fatigue initiation site did not contain scoring marks or scratches. All connecting rod journals measured 2.114 inches. The No. 3 connecting rod journal superficial macro hardness was slightly below the minimum specified limit, while the core hardness was within limits. The overall aft radius was determined to be 0.152 inch, while a localized transition radius of .015 inch at the fatigue origin location was noted. The crankshaft had been to two FAA certified repair stations (FAA CRS), the first time on December 14, 1991, and the second time on August 2, 2001. Both repair stations rejected the crankshaft due to a crack in the No. 1 main bearing area. The records from the facility that inspected the crankshaft in 2001 indicate the No. 3 connecting rod journal measured 2.1193 inches at the time it was rejected; no work was performed to it. The owner reported that following the rejection in 2001, he took the crankshaft to another FAA CRS who reportedly ground two connecting rod journals and polished the crankshaft. The owner did not have a receipt or yellow tag for the work performed to the crankshaft. The engine was assembled, and had been operated 87.8 hours since being reassembled at the time of the crankshaft failure. The president of the FAA CRS that the owner of the airplane reported last worked on the crankshaft reported he did not have any records pertaining to the accident crankshaft. He also reported that he voluntarily closed his business in August 2002, to retire.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The improper repair of the crankshaft by a FAA Certified Repair Station resulting in fatigue failure and subsequent total loss of engine power. A factor in the accident was the rough/uneven terrain encountered by the pilot during the landing roll in a field.

### Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF  
Phase of Operation: CRUISE - NORMAL

#### Findings

1. (C) ENGINE ASSEMBLY,CRANKSHAFT - FATIGUE
2. (C) MAINTENANCE,MAJOR REPAIR - IMPROPER - OTHER MAINTENANCE PERSONNEL

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

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Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER  
Phase of Operation: EMERGENCY LANDING

#### Findings

3. (F) TERRAIN CONDITION - ROUGH/UNEVEN

## Factual Information

On July 1, 2003, about 1240 eastern daylight time, a homebuilt Velocity, N51576, registered to a private individual, experienced a total loss of engine power during cruise flight near Sebastian, Florida. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 CFR Part 91 personal flight. The airplane was substantially damaged and the commercial-rated pilot sustained minor injuries while a passenger sustained serious injuries. The flight originated about 10 minutes earlier from the Sebastian Municipal Airport, Sebastian, Florida.

The pilot stated that about 10 minutes after takeoff during cruise flight at 1,500 feet with the passenger flying the airplane, the engine briefly "shuddered", and the rpm dropped to 2,000, then to zero. He took the controls and attempted to restore engine power but was unsuccessful. He maneuvered the airplane for a forced landing in a field, and when the flight was approximately 20 feet above ground level he recognized there were drainage ditches in the field. The airplane was landed in the field, and during the landing roll the nose landing gear collapsed after traveling into a ditch. The airplane then slid into a second ditch, and came to rest approximately 158 feet from the first ditch impact location.

Examination of the engine revealed the crankshaft was fractured at the No. 3 cylinder connecting rod journal; there was no evidence of lack of lubrication, or fretting on the faying surfaces of the crankcase halves. The crankshaft was removed and sent to the NTSB Metallurgy Laboratory located in Washington, D.C., for further examination.

NTSB metallurgical examination of the crankshaft revealed the fracture surface was located in the aft radius of the No. 3 connecting rod journal; fatigue progression was noted to initiate from the intersection of the radius and the journal. The fracture propagated in a plane perpendicular to the journal surface from a single origin. The fatigue initiation site did not contain scoring marks or scratches. All connecting rod journals measured 2.114 inches. The No. 3 connecting rod journal superficial macro hardness was slightly below the minimum specified limit, while the core hardness was within limits. The overall aft radius was determined to be 0.152 inch, while a localized transition radius of .015 inch at the fatigue origin location was noted.

The crankshaft had been to two FAA certified repair stations (FAA CRS), the first time on December 14, 1991, and the second time on August 2, 2001. Both repair stations rejected the crankshaft due to a crack in the No. 1 main bearing area. The records from the facility that inspected the crankshaft in 2001 indicate the No. 3 connecting rod journal measured 2.1193 inches at the time it was rejected; no work was performed to it.

The owner reported that following the rejection in 2001, he took the crankshaft to another FAA CRS who reportedly ground two connecting rod journals and polished the crankshaft. The owner did not have a receipt or yellow tag for the work performed to the crankshaft. The engine was assembled, and had been operated 87.8 hours since being reassembled at the time of the crankshaft failure.

The president of the FAA CRS that the owner of the airplane reported last worked on the crankshaft reported he did not have any records pertaining to the accident crankshaft. He also reported that he voluntarily closed his business in August 2002, to retire.

The airplane minus the retained crankshaft was released to the airplane owner on October 29,

2003. The retained crankshaft was also released to the airplane owner on August 20, 2004.

### Pilot Information

<b>Certificate:</b>	Flight Instructor; Commercial	<b>Age:</b>	67, 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>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Single-engine	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	08/10/2002
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	08/10/2002
<b>Flight Time:</b>	4200 hours (Total, all aircraft), 1247 hours (Total, this make and model), 4200 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Samual G. DaSilva	<b>Registration:</b>	N51576
<b>Model/Series:</b>	Velocity	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	DMO-0112
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	03/11/2003, Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>	24.1 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	760 Hours as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-360-A1A
<b>Registered Owner:</b>	Samuel G. DaSilva	<b>Rated Power:</b>	180 hp
<b>Operator:</b>	Samuel G. DaSilva	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KVRB, 24 ft msl	Distance from Accident Site:	
Observation Time:	1253 EDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	15 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	130°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.11 inches Hg	Temperature/Dew Point:	31 °C / 24 °C
Precipitation and Obscuration:			
Departure Point:	Sebastion, FL (X26)	Type of Flight Plan Filed:	None
Destination:	St. Petersburg, FL (KPIE)	Type of Clearance:	None
Departure Time:	1230 EDT	Type of Airspace:	Class G

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 Minor	Latitude, Longitude:	27.816667, -80.683333

## Administrative Information

Investigator In Charge (IIC):	Timothy W Monville	Report Date:	10/28/2004
Additional Participating Persons:	Jon S Strickland; FAA Flight Standards District Office; Orlando, FL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinquiry@ntsb.gov">pubinquiry@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).