Aviation Investigation Final Report

Location:	Porterville, California	**Accident Number:**	WPR09LA049
Date & Time:	November 27, 2008, 09:25 Local	**Registration:**	N936EW
Aircraft:	RAYTHEON AIRCRAFT COMPANY G36	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During an instrument approach in instrument meteorological conditions, the flight entered the ground fog layer at 1,300 feet mean sea level (msl) and continued descending to the minimum descent altitude of 980 feet msl. Upon reaching the minimum descent altitude, the pilot asked his passengers if "they saw anything." The pilot stated that he "saw a few breaks." As the airplane neared the missed approach point, the pilot further reported that he declared a missed approach and applied full power. He stated that the engine did not respond and made an unusual sound "like a car would make if its automatic transmission would not grab." The pilot added that he was not getting power and briefed his passengers to brace themselves. Shortly thereafter, the airplane struck trees and the ground within an orange orchard. Both wings and the fuselage were substantially damaged. Examination of the airframe, engine, and propeller assemblies revealed no related preimpact mechanical anomalies.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power for undetermined reasons.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Approach-IFR missed approach	Loss of engine power (total) (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On November 27, 2008, about 0925 Pacific standard time, a Raytheon Aircraft Company G36 single-engine airplane, N936EW, was substantially damaged when it impacted terrain following a reported loss of engine power during a missed approach from the Porterville Municipal Airport (PTV), Porterville, California. The airplane was registered to Solar One Systems Inc. of Carson City, Nevada, and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The instrument rated private pilot and one of his two passengers sustained serious injuries and one passenger sustained minor injuries. Instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed for the personal flight. The cross-country flight originated from Redlands, California, about 0800 with an intended destination of PTV.

Review of recorded communications between the pilot and Bakersfield Approach Control revealed that at 0902, the controller cleared the pilot for the "Porterville VOR approach" followed by the pilot acknowledging the clearance. At 0909, the controller cleared the pilot to change to a local advisory frequency, followed by the pilot acknowledging the clearance. No further radio communication was received from the pilot.

In a written statement, the pilot reported that during the VOR approach, he performed the "pre-landing checklist" at the WRING intersection. Upon reaching the minimum descent altitude of 980 feet, the pilot added power to maintain altitude. The pilot stated that as he added power, the "engine made a loud abnormal droning sound" and he applied "full throttle, verified full rich/high RPM and was unable to restore the engine to normal operating conditions." The pilot further stated that "...insufficient power to maintain altitude was available so I [he] maintained the heading and told the passengers to brace for an emergency landing."

During a telephone conversation with a Federal Aviation Administration (FAA) inspector, the pilot reported that he entered the layers of fog approximately 1,300 feet. Upon reaching 980 feet, the pilot asked his passengers if "they saw anything." The pilot stated that he "saw a 'few' breaks." As the airplane neared the missed approach point, the pilot further reported that he "declared a missed approach" and applied full power. He stated that the engine did not respond and made an "unusual" sound "like a car would make if its automatic transmission would not grab." The pilot added that he was "not getting power" and briefed his passengers

to brace themselves. Shortly after, the airplane struck trees and the ground within an orange orchard.

During a telephone conversation with an FAA inspector, the passenger reported that as they approached the instrument approach part of the flight, she recalled that the pilot asked her if she could "see the ground." The passenger stated that initially the fog was patchy but as they continued, she lost all contact with the ground until the accident. She added that the pilot told her to "keep looking" followed by "we're going around." The passenger further stated that the engine was not responding, making "a very loud and unusual noise."

Examination of the accident site by an FAA inspector revealed that the airplane came to rest upright within an orange grove about 1 mile south of PTV. The engine was separated from the engine firewall and the left wing was partially separated from the fuselage. The wreckage was recovered to a secure facility for further examination.

METEOROLOGICAL INFORMATION

Review of recorded observations from the Automated Weather Observation System (AWOS) located at PTV revealed at 0915 were wind from 300 degrees at 5 knots, visibility 3/4 statute miles, overcast cloud layer at 200 feet above ground level (agl), temperature 13 degrees Celsius, dew point 12 degrees Celsius, and an altimeter setting of 30.09 inches of Mercury.

At 0935, the AWOS at PTV reported wind from 300 degrees at 4 knots, visibility 1/2 statute miles, overcast cloud layer at 200 feet agl, temperature 12 degrees Celsius, dew point 12 degrees Celsius, and an altimeter setting of 30.09 inches of Mercury.

TESTS AND RESEARCH

On December 16, 2008 at the facilities of Plain Parts, Pleasant Grove, California, the engine and airframe were examined by representatives from Hawker Beechcraft Corporation and Teledyne Continental Motors under the supervision of the Safety Board investigator-in-charge (IIC).

Examination of the airframe revealed that the right wing exhibited a circular impression that extended aft to the wing spar about six inches outboard of the right wing fuel cap. The landing gear attachment structure was pushed upwards through the top of the right wing with severe deformation of the wing structure.

About five feet of the inboard left wing remained attached to the fuselage. The left main landing gear structure was crushed upwards through the top of the wing. The left main landing gear was separated. The outboard portion of the wing exhibited severe deformation throughout.

The forward portion of the fuselage, which included the instrument panel, engine firewall, and lower floor board was separated forward of the main wing spar and two front seats. Extensive

damage was observed to the instrument panel and surrounding area. The flight control column and associated hardware were intact and exhibited impact damage. One of the control column yokes was separated. The throttle quadrant was separated and exhibited impact damage. The throttle, mixture, and propeller levers were observed at the full aft position. A circular impression was observed within the fuselage structure just forward of the wing spar. The landing gear retract gearbox actuator arm was observed in a position consistent with the landing gear being in a down and locked position. The fuel selector valve was intact and undamaged and observed in the "OFF" position. According to wreckage recovery personnel, the fuel selector valve was placed in the "OFF" from the "RIGHT" position prior to transport. Fuel was observed within all of the lines during removal of the fuel selector valve. Fuel was drained from the selector valve drain port. The fuel was blue in color and free of debris. The fuel selector valve screen contained a slight amount of lint particles, but was unobstructed.

Examination of the recovered airframe and flight control system components revealed no evidence of pre-impact anomalies.

Examination of the Teledyne Continental Motors IO-550-B (39) engine, serial number 687086, revealed that the engine and mounts were separated from the engine firewall. All of the engine accessories and cylinders remained attached to the crankcase. The exhaust system was intact and exhibited impact damage. The induction system was intact and exhibited impact damage. The rocker box covers, top spark plugs, secondary alternator, fuel pump, and propeller were removed from the engine. All six cylinders were examined internally using a lighted borescope and exhibited normal operational signatures. The crankshaft was manually rotated using a hand tool attached to the accessory drive pad. Rotational continuity was established from the rear of the engine to the forward accessory drive gear and throughout the valve train. Thumb compression was obtained on all six cylinders along with equal movement of all of the intake and exhaust valve rocker arms. The left and right magnetos produced spark on all ignition leads along with impulse coupling engagement when the crankshaft was manually rotated.

Examination of the propeller revealed that propeller blade A was loose in the propeller hub and exhibited aft bending and a decreased pitch twist from the blade shank to the tip. The propeller blade cambered side exhibited multidirectional scratches and gouges. Propeller blade B was loose in the propeller hub and exhibited aft bending and a decreased pitch twist from the midsection of the blade to the tip. The blade cambered side exhibited multidirectional scratches. Propeller blade C was loose in the propeller hub and exhibited aft bending and a decreased pitch twist from the midsection of the blade to the tip. The blade tip exhibited scuffing and leading edge damage.

Examination of the recovered engine and system components revealed no evidence of pre-impact mechanical anomalies.

The propeller assembly and propeller governor were sent to their respective manufacturers for further examination.

On January 27, 2009, at the facilities of Ontic Engineering and Manufacturing, Van Nuys, California, the propeller governor was examined under the supervision of a Safety Board investigator. The examination of the propeller governor revealed no pre-impact related mechanical anomalies.

On March 3, 2009, at the facilities of Hartzell Propeller Inc., Piqua, Ohio, the propeller assembly was examined under the supervision of an FAA inspector. The examination of the propeller assembly revealed no pre-impact related mechanical anomalies.

Pilot Information

Certificate:	Private	**Age:**	49,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 6, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2215 hours (Total, all aircraft), 2136 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	RAYTHEON AIRCRAFT COMPANY	**Registration:**	N936EW
Model/Series:	G36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E-3645
Landing Gear Type:	Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 10, 2008 Annual	**Certified Max Gross Wt.:**	3663 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	390 Hrs as of last inspection	**Engine Manufacturer:**	Teledyne Continental Motors
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-B
Registered Owner:	Solar One Systems LLC	**Rated Power:**	300 Horsepower
Operator:	John Thomas Werle	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PTV,442 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	09:35 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:		**Visibility**	0 miles
Lowest Ceiling:	Overcast / 200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	12°C / 12°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	Redlands, CA	**Type of Flight Plan Filed:**	IFR
Destination:	Porterville, CA (PTV)	**Type of Clearance:**	IFR
Departure Time:	08:26 Local	**Type of Airspace:**	Unknown

Airport Information

Airport:	Porterville Municipal Airport PTV	**Runway Surface Type:**	
Airport Elevation:	442 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	VOR
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious, 1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 1 Minor	**Latitude, Longitude:**	36.029445,-119.0625(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	James A Henry; Federal Aviation Adminsitration; Fresno, CA Andrew Swick; Teledyne Continental Motors; Mobile, AL Eric Thomas; Hawker Beechcraft Company; Wichita, KS Tom McCreary; Hartzell Propeller Inc.; Piqua, OH John Margrave; Ontic; Van Nuys, CA
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