



National Transportation Safety Board Aviation Accident Final Report

Location:	Reno, NV	Accident Number:	WPR16LA181
Date & Time:	09/16/2016, 1715 PDT	Registration:	N4861K
Aircraft:	DEHAVILLAND DH115 VAMPIRE	Aircraft Damage:	Substantial
Defining Event:	Part(s) separation from AC	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Air Race/Show		

Analysis

The airline transport pilot reported that, during an air race flight, he heard a "loud bang," followed by wind noise and wind entering the cockpit. The pilot immediately aborted the race by pitching the airplane up and reducing power to idle, at which point he noticed that the right side of the canopy was fractured. The pilot added that he noted throughout the climb and orbit that all engine gauges displayed normal indications as he set up for landing. As the pilot established on the downwind leg for his intended runway, he advanced the power lever and realized the engine had lost power. The pilot realized that the airplane was not going to be able to reach any of the runways, so he chose to land in the open desert north of the airport. He conducted an engine restart procedure without success. Subsequently, the pilot initiated a forced landing with the landing gear and flaps in the retracted position.

A majority of the right canopy window was fractured from the frame. The aft canopy frame had deformation damage as did the airplane structure above and aft of the upper portion of the right seat. Postaccident examination of the canopy and the reconstructed right window (about 79% of the window was identified and reconstructed) revealed no evidence of any preexisting crazing, scratching, or other anomalies that would have contributed to the fracture of the right canopy. Postaccident examination of the engine revealed no evidence of any preexisting malfunctions that would have precluded normal operation. Neither the reason for the fractured canopy nor the engine failure could be determined.

Probable Cause and Findings

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

The in-flight failure of the canopy and subsequent loss of engine power for reasons that could not be determined because postaccident examination of the airframe and engine revealed no anomalies that would have precluded normal operation.

Findings

Not determined	Not determined - Unknown/Not determined (Cause)
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Factual Information

On September 16, 2016, about 1715 Pacific daylight time, a De Havilland DH115 Vampire, N4861K, sustained substantial damage during an off-airport landing near the Reno-Stead Airport (RTS), Reno, Nevada. The airplane was registered to CB Aviation Inc., Ogden, Utah, and operated by the pilot under the provisions of 14 *Code of Federal Regulations* Part 91. The airline transport pilot, sole occupant of the airplane, was not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local air race flight, which originated from RTS about 9 minutes prior to the accident.

The pilot reported in both written and verbal statements that he was participating in a Jet Class Gold Race at the National Championship Air Races, which consisted of 6 laps around a closed race course. About 3.5 laps into the race, while approaching pylon 4, the pilot heard a "loud bang" followed by wind noise and wind within the cockpit. The pilot immediately aborted the race, pitched up, and reduced power to idle, trading airspeed for altitude. The pilot stated that he assessed all primary flight controls and trim, noting no anomalies except for the trim wheel, which was jammed. The pilot also observed a crack in the right side of the canopy. Throughout the climb, the pilot noted that all engine gauges displayed a normal indication.

The pilot further reported that while orbiting the airport at best glide speed, he was able to free the jammed trim wheel and continued to enter downwind for runway 08. Upon turning onto downwind, he advanced the power lever and realized the engine had lost power. The pilot said he evaluated his option for landing, realizing he was unable to reach runway 14 or runway 08, and elected to land in the open desert north of the airport as he conducted an engine restart procedure. Subsequently, the pilot initiated a forced landing with the landing gear and flaps in the retracted position.

Examination of the accident site revealed that the airplane came to rest up right about 7,741 feet north, northwest of the approach end of runway 08. The wreckage debris path was oriented on a heading of about 345⁰ and was about 756 feet in length. Portions of plexiglass from the airplane's canopy structure were located about 1.57 miles southwest of the accident site. The wreckage was recovered to a secure location for further examination.

The accident airplane was powered by a single jet engine mounted on the airplane centerline aft of the cockpit and has a twin tailboom tail arrangement. The cockpit is set up with side-by-side seating for two pilots. The canopy consisted of a metal frame with acrylic windows installed on the left and right sides. The acrylic windows wrap from above the pilot's heads around the left and right sides with complex curvatures. The edges of the acrylic windows are reinforced with fiberglass where the frame screws pass through to secure the window to the frame. The canopy is hinged at the aft, upper edge to open upward.

Examination of the recovered wreckage revealed that the lower fuselage of the airplane was crushed and deformed upward consistent with damage from the forced landing. The left canopy window had a small hole and cracks emanating from the hole coincident with the location of the upper portion of the left seat. A majority of the right canopy window was

fractured from the frame. There was damage and deformation to the aft canopy frame and airplane structure above and aft of the upper portion of the right seat.

The right canopy window was reconstructed in the canopy frame by matching the fracture surfaces of the individual pieces utilizing tape to hold the fragments in place. About 70% of the right canopy window was conclusively identified and placed on the reconstruction. The recovered fragments from the aft half of the window were smaller than those from the forward half. Seven small pieces of canopy could not be conclusively placed on the reconstruction. None of the fractures intersected the screw holes around the periphery of the window. There was no evidence of crazing, scratching, or other pre-existing anomalies on the window fragments examined.

Examination of the engine revealed that all fuel lines were intact. The lower portion of the burner ring was impact damaged. All of the environmental control system was intact. The fuel control unit lever linkage was impact damaged. The power lever moved by hand from stop to stop. Dirt debris was observed throughout the engine from the inlet to the exhaust tailpipe.

History of Flight

Maneuvering-low-alt flying	Part(s) separation from AC (Defining event) Powerplant sys/comp malf/fail Off-field or emergency landing
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Pilot Information

Certificate:	Airline Transport	Age:	47, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	09/01/2016
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/05/2015
Flight Time:	20000 hours (Total, all aircraft), 75 hours (Total, this make and model), 19500 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	DEHAVILLAND	Registration:	N4861K
Model/Series:	DH115 VAMPIRE 55	Aircraft Category:	Airplane
Year of Manufacture:	1956	Amateur Built:	No
Airworthiness Certificate:	Experimental	Serial Number:	186
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	Continuous Airworthiness	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Turbo Fan
Airframe Total Time:		Engine Manufacturer:	AMA/EXPR
ELT:	Installed, not activated	Engine Model/Series:	UNKNOWN ENG
Registered Owner:	CB Aviation	Rated Power:	hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KRTS, 5053 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	0015 UTC	Direction from Accident Site:	164°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	90°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.13 inches Hg	Temperature/Dew Point:	24° C / -13° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Reno, NV (RTS)	Type of Flight Plan Filed:	None
Destination:	Reno, NV (RTS)	Type of Clearance:	None
Departure Time:	PDT	Type of Airspace:	Class G

Airport Information

Airport:	RENO/STEAD (RTS)	Runway Surface Type:	N/A
Airport Elevation:	5050 ft	Runway Surface Condition:	Dry
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	39.702778, -119.889444 (est)

Administrative Information

Investigator In Charge (IIC):	Joshua Cawthra	Report Date:	01/25/2018
Additional Participating Persons:	Gerald Rose; Federal Aviation Administration; Reno, NV		
Publish Date:	01/25/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94023		

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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](#).