



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Reno, Nevada	Accident Number:	WPR09LA458
Date & Time:	September 19, 2009, 08:15 Local	Registration:	C-FDX0
Aircraft:	Cassutt III M	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Serious
Flight Conducted Under:	Part 91: General aviation - Air race/show		

Analysis

The pilot was involved in a race and observed the engine begin to overheat. He elected to perform a precautionary landing and adjoined the traffic pattern of the nearby airport. While on the base leg to the runway, the engine stopped producing power and the airplane began to rapidly loose altitude. The airplane landed hard about 50 yards from the approach end of the runway, resulting in substantial damage to the airframe's tubular steel structure. A portion of a connecting rod was located within the debris surrounding the wreckage. An examination of the engine revealed a hole in the crankcase above the Nos. 1 and 2 cylinders. The connecting rod for the No. 2 cylinder was fractured and separated below the piston wrist pin; the piston end rotated freely and the crankshaft end was fractured. The connecting rod pieces exhibited blue discoloration and the fracture surfaces exhibited mechanical peen damage. The crankshaft journal for the cylinder No. 2 connecting rod exhibited a blue discoloration, as did the camshaft journal. The No. 2 connecting rod bearings showed a similar blue discoloration. The oil screen contained magnetic metallic debris.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power due to failure of the No. 2 connecting rod as a result of operation of the engine at excessive temperatures.

Findings

Aircraft	Recip eng oil sys - Capability exceeded
Aircraft	Recip engine power section - Capability exceeded
Aircraft	Landing flare - Not specified

Factual Information

History of Flight

Maneuvering	Powerplant sys/comp malf/fail
Approach-VFR pattern base	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-flare/touchdown	Hard landing

On September 19, 2009, about 0815 Pacific daylight time, an experimental Cassutt III M, C-FDXO, made a forced landing at Reno Stead Airport, Reno, Nevada. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The airline transport pilot sustained serious injuries; the airplane sustained substantial damage from impact forces. The local air race flight departed from Reno Stead at 0800. Visual meteorological conditions prevailed, and no flight plan had been filed.

The pilot's crew chief reported that during an air race 2 days prior to the accident, a SCAT tube from the oil cooler separated in flight, and the engine overheated. He stated that, during a post race examination, the maintenance crew could hear the synthetic oil boiling, and observed globs of oil being ejected from the engine breather tube. He noted that it took the engine about 6 hours to cool before they were able to work on it. They drained the remaining oil, and checked the oil screen, which contained no debris. They examined the cylinders internally with a borescope, and noted no damage. In addition, the crankshaft rotated freely. They changed the oil, and the crew chief instructed the pilot to monitor the temperature closely during the next race.

During the accident race, the pilot reported that the engine was overheating, but turning. He elected to perform a precautionary landing on runway 14. As he was on the base leg to the runway, the engine stopped rotating, and the airplane began sinking rapidly. The airplane landed hard about 50 yards from the approach end of the runway.

Examination of the airplane revealed that the airframe tubular steel structure buckled, and sustained substantial damage. Oil was along the right side of the fuselage.

The central portion of a connecting rod and bearing pieces were located within the debris surrounding the wreckage. The fracture surfaces at both ends of the rod piece were angular and irregular; the connecting rod piece was also twisted.

Examination of the engine by the Safety Board investigator-in-charge (IIC) revealed a hole in the crankcase above cylinders number one and two. All cylinders were secure to the crankcase on their base. There was oil in the oil sump and oil screen. The oil screen contained debris; a magnet attracted some of the debris.

The crankshaft could be rotated manually. The IIC noted movement of the numbers one, three, and four cylinders' piston. The number two piston did not move in the barrel. Investigators removed cylinders number two and four, and split the crankcase.

The main bearings were in proper position. The connecting rod for cylinder number two fractured and separated about 1 inch below the piston wrist pin. The remaining portion of the connecting rod was twisted and discolored. The piston end of the connecting rod rotated freely; the crankshaft end of this connecting rod fractured and separated from the crankshaft. Its pieces exhibited blue discoloration, and the fracture surfaces exhibited mechanical peen damage. The crankshaft journal for cylinder number two connecting rod exhibited a blue discoloration, as did the camshaft journal. The number two connecting rod bearings exhibited a blue discoloration and were smeared.

Pilot Information

Certificate:	Airline transport	Age:	Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Single
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:	Class 1 Unknown	Last FAA Medical Exam:	June 15, 2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 19, 2009
Flight Time:	4500 hours (Total, all aircraft), 150 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cassutt	Registration:	C-FDXO
Model/Series:	III M	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	0489
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	May 1, 2009 Condition	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	125 Hrs	Engine Manufacturer:	Teledyne Continental Motors
ELT:	Not installed	Engine Model/Series:	O-200
Registered Owner:	Adrian Cooper	Rated Power:	
Operator:	Adrian Cooper	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	RNO,4415 ft msl	Distance from Accident Site:	7 Nautical Miles
Observation Time:	07:55 Local	Direction from Accident Site:	180°
Lowest Cloud Condition:	Few / 9000 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 25000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.07 inches Hg	Temperature/Dew Point:	18°C / 4°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:	08:00 Local	Type of Airspace:	

Airport Information

Airport:	Reno/Stead RTS	Runway Surface Type:	Asphalt
Airport Elevation:	5050 ft msl	Runway Surface Condition:	Dry
Runway Used:	14	IFR Approach:	None
Runway Length/Width:	9000 ft / 150 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	39.668056,-119.876388(est)

Administrative Information

Investigator In Charge (IIC): Plagens, Howard

Additional Participating Persons: Harry Smith; FAA FSDO; Reno, NV

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Last Revision Date:

Investigation Class: [Class](#)

Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=74767>

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