Aviation Investigation Final Report

Location:	New Orleans, Louisiana	**Accident Number:**	CEN12LA076
Date & Time:	November 20, 2011, 10:30 Local	**Registration:**	N211CD
Aircraft:	CIRRUS DESIGN CORP SR20	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Shortly after takeoff in instrument meteorological conditions over water, the pilot observed the No. 2 cylinder head temperature (CHT) rapidly increase followed by a drop in oil pressure. He declared an emergency and attempted to return to the airport, but the engine failed and the propeller seized. The pilot landed safely on the water and was rescued by a local fisherman. Examination of the engine revealed the No. 2 fuel injector nozzle was clogged resulting in detonation of the No. 2 cylinder. A review of maintenance records revealed that each of the fuel injector nozzles was removed and cleaned 5 days before the accident. The pilot said he had the nozzles cleaned because he noticed a high CHT on the No. 2 cylinder during a cross-country flight. After the nozzles were cleaned, they were placed back on the engine and two separate engine runs were conducted. No anomalies were noted. The pilot then flew a 2.5 hour cross-country flight without incident. However, on the pilot's next flight, which was the accident flight, the engine failed due to detonation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to detonation of the No.2 cylinder from a clogged fuel injector nozzle.

Findings

Aircraft	Fuel injector nozzle - Not specified
Aircraft	Recip eng cyl section - Failure

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)

On November 20, 2011, at 1030 central standard time, N211CD, a Cirrus SR20, a single-engine airplane, sustained substantial damage when it ditched in Lake Ponchartrain, about four miles north of Lakefront Airport (NEW), New Orleans, Louisiana, after a total loss of engine power shortly after takeoff. The airline transport rated pilot sustained minor injuries. The airplane was registered to and operated by the pilot. An instrument flight rules flight plan was filed for the flight that departed NEW about 1015 and destined for Dalton Municipal Airport (DNN), Dalton, Georgia. Instrument meteorological conditions prevailed for the personal flight conducted under 14 Code of Federal Regulations Part 91.

The pilot reported that shortly after takeoff from NEW, he observed the No. 2 cylinder head temperature (CHT) rapidly increase followed by a drop in oil pressure. He immediately turned back to the airport and requested short vectors for an instrument approach into NEW. The pilot said that when the airplane was about four miles from the runway, the engine "blew" and the propeller seized. He immediately declared an emergency; slowed the airplane to 80 knots and prepared for a landing in the water. The pilot said he broke through the low cloud layer at 300-feet at which point, he extended the flaps to 15 degrees, reduced airspeed until he heard the stall horn, and deployed the ballistic parachute system. The pilot made a wings-level landing on the water and remained upright. He then contacted air traffic control to inform them he was in the water. The pilot donned a life jacket and safely exited the airplane. When he exited the airplane, he noted oil streaks on the bottom side of the engine cowling. The pilot rested on the tail of the partially submerged airplane for approximately forty-five minutes until a local fisherman arrived and picked him up. The only damage to the airplane was a wrinkle in the firewall.

The engine was examined at Continental Motors Incorporated, Mobile, Alabama, under the supervision of the Investigator-in-Charge (IIC). An external examination of the engine revealed no obvious impact damage; breaches to the engine case, or leaking oil. The only damage was from exposure to water. When the crankshaft flange was manually rotated, it stopped at approximately 300 degrees of travel before it locked up.

Disassembly of the engine revealed the No. 2 piston exhibited damage consistent with detonation. The No. 1 and No. 6 piston rods were broken and were dark in color from exposure to heat. The other piston rods were also damaged and exhibited damage consistent with exposure to heat. The crankshaft was fractured in two sections and pieces of the No.6 piston cap were found in the oil sump.

The fuel pump and throttle body were flushed to remove any water and debris before flushing the metering unit. The fuel metering unit was removed and flushed. A clean glass jar was placed under each nozzle to capture any water and debris. No visible debris was noted and each jar appeared to fill uniformly.

The fuel injector nozzles were removed and bench-tested. The No. 2 nozzle tested about two pounds below the minimum value. Shop air was then blown through the nozzle with a paper filter placed on the other end to catch any debris. The nozzle was re-tested and it produced a better value, but was slightly below the minimum value. Shop air was again blown through the nozzle and a paper filter was used to capture any debris. More debris was visually noted on the second forced air attempt than the first attempt. The nozzle was re-tested and its performance was not improved. The filters were examined using an electron microscope and several specs of black dirt were noted. The other nozzles tested slightly below minimum values indicating they were operating lean.

A review of maintenance records revealed that the fuel injector nozzles were removed and cleaned five days before the accident on November 13, 2011. The pilot said he had them cleaned because he noticed a high CHT on the No. 2 cylinder during a cross country flight from Louisiana to Arkansas. After the nozzles were cleaned, they were placed back on the engine and two separate engine runs were conducted. No anomalies were noted. The pilot then flew back to Louisiana (a 2.5 hour flight) and everything was "normal." However, on his next flight, which was the accident flight, the subsequent engine failure occurred.

Information

Certificate:	**Age:**	
Airplane Rating(s):	**Seat Occupied:**	
Other Aircraft Rating(s):	**Restraint Used:**	
Instrument Rating(s):	**Second Pilot Present:**	No
Instructor Rating(s):	**Toxicology Performed:**	No
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	**Registration:**	N211CD
Model/Series:	SR20	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1049
Landing Gear Type:		**Seats:**	4
Date/Type of Last Inspection:	August 18, 2011 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	IO360 SER A&C
Registered Owner:	GLASS THOMAS BROOKS	**Rated Power:**	200 Horsepower
Operator:	GLASS THOMAS BROOKS	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	NEW,7 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	10:15 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Thin Overcast	**Visibility**	3 miles
Lowest Ceiling:	Overcast	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	73°C / 72°C
Precipitation and Obscuration:			
Departure Point:	New Orleans, LA (NEW)	**Type of Flight Plan Filed:**	IFR
Destination:	Dalton, GA	**Type of Clearance:**	IFR
Departure Time:	10:15 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	
Total Injuries:	1 Minor	**Latitude, Longitude:**	30.036388,-90.020835(est)

Administrative Information

Investigator In Charge (IIC):	Yeager, Leah
Additional Participating Persons:	
Original Publish Date:	December 11, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=82366