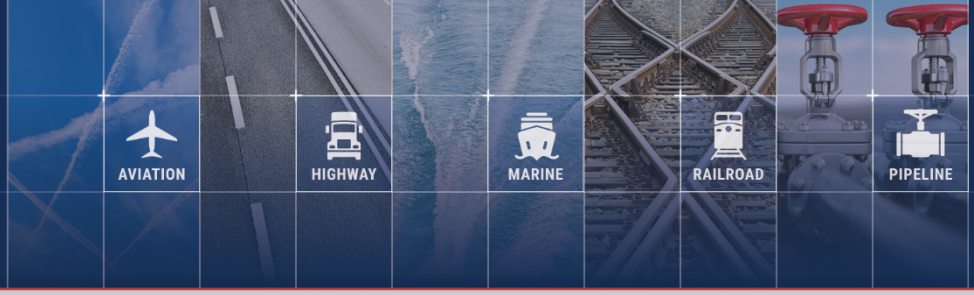

Aviation Investigation Final Report

Location:	Oroville, California	**Accident Number:**	WPR09LA237
Date & Time:	May 10, 2009, 13:10 Local	**Registration:**	N1457M
Aircraft:	Cessna U206E	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane owner/pilot departed for a personal flight with 55 gallons of fuel in the airplane's fuel tanks. After flying for nearly 40 minutes all engine power was suddenly lost. The pilot reported that, because he was only 1,100 feet above the ground, he had limited time to attempt an engine restart. Therefore, the pilot concentrated on performing the forced landing. The pilot landed in an open field. During rollout on the uneven terrain, the nose gear collapsed and the firewall was bent. Subsequently, the airplane was recovered and examined and no anomalies were found. The engine was test run and no evidence of any mechanical malfunction was noted. The airplane was equipped with an engine monitoring system that retained various engine related operating parameters. The extracted nonvolatile memory data revealed that the engine's exhaust gas temperature peaked a few seconds before the fuel flow decreased to zero and all power was lost. The data was consistent with an interruption of fuel flow to the engine due to an overly lean mixture; however, the investigation could not determine the cause of the excessively lean mixture.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of engine power during cruise flight due to an excessively lean mixture for undetermined reasons.

Findings

Environmental issues	Rough terrain - Contributed to outcome
Aircraft	(general) - Not specified

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-landing roll	Collision with terr/obj (non-CFIT)

On May 10, 2009, about 1310 Pacific daylight time, a Cessna U206E, N1457M, experienced a total loss of engine power while cruising about 5 miles north of Oroville, California. The private pilot made a forced landing in an open field. The airplane's nose gear broke off as the airplane decelerated over uneven terrain, the firewall was bent, and the airplane was substantially damaged. The private pilot was not injured during the personal flight that was performed in the airplane, which he co-owned. Visual meteorological conditions prevailed, and no flight plan had been filed. The flight was performed under the provisions of 14 Code of Federal Regulations Part 91, and it originated from Marysville, California, about 1230.

The pilot reported to the National Transportation Safety Board investigator that when his flight initiated, the airplane's fuel tanks contained a total of 55 gallons of 100 LL fuel. After takeoff, he performed two uneventful touch-and-go landings. Thereafter, he climbed to a 2,600-foot mean sea level (msl) cruise altitude.

There were no clouds in the sky, and the wind was calm. The visibility was 100 miles.

According to the pilot, while cruising the engine suddenly "died, as if the [ignition] key were shut off." Immediately thereafter, engine power returned without his taking action, and then the engine died completely.

The pilot stated that he responded to the emergency by switching fuel tanks and also activating the electric fuel pump. The propeller continued to windmill. Due to the airplane's low altitude, he then concentrated on executing the forced landing. His efforts at restarting the engine were not successful, and he landed the airplane on the nearby rough terrain, about 1,100 feet msl.

Airplane recovery personnel reported to the Safety Board investigator finding evidence of fuel in all of the airplane's fuel tanks. The airplane was recovered from the accident site and examined by Federal Aviation Administration (FAA) personnel.

In pertinent part, FAA personnel reported observing minimal propeller blade damage, which they opined was consistent with low or no engine power at impact. Control continuity between the cockpit's engine controls and the engine was confirmed. No anomalies were noted with the magnetos, examined spark plugs, cylinders, or internal engine components during rotation of

the engine's crankshaft. The integrity of the fuel system was confirmed between the wings and the engine. The fuel vents in the wings and the bladder tanks were examined, and no blockages were noted.

To ascertain the functionality of the powerplant, an FAA principal maintenance inspector test ran the engine. The FAA inspector reported that the electric fuel pump operated normally, and the engine properly started. Thereafter, it was test run for 12 minutes. No anomalies were noted. At the conclusion of the examination, the FAA inspector reported finding no evidence indicating why the reported power loss occurred.

The accident airplane was equipped with a J.P. Instruments, Inc. (JPI), engine data management (EDM-800) system that recorded various engine operating conditions. Following the FAA's engine test run, the EDM-800 was removed from the airplane. Under the Safety Board's supervision, its retained memory was downloaded by JPI's personnel at their manufacturing facility. JPI personnel reported to the Safety Board investigator that the instrument appeared undamaged, and the downloaded file contained data that did not appear corrupt.

The downloaded file of the accident flight was reviewed by Safety Board personnel. A data graph showing the accident flight is included in the docket for this accident report. In pertinent part, the graph includes the following data for Time, Exhaust Gas Temperature (#1 cylinder, degrees Fahrenheit) Fuel Flow, and Revolutions Per Minute:

*TIME	EGT	FF	RPM	NOTES
2117:54	1378	17.6	2465	(EGT remained bet. 1378 & less than 1417)
2124:12	1354	16.2	2345	(EGT rose to 1417 at 2124:24)
2124:24	1417	11.2	2339	(Peak EGT occurred here)
2124:30	1007	0.9	2130	
2124:36	572	0.0	1937	
2125:42	241	0.0	0	

*See the docket for information regarding event times and all recorded data.

JPI's Pilot's Guide indicates that retarding the mixture control changes the fuel/air ratio and hence the exhaust gas temperature. The Guide states: "As the mixture is leaned, EGT rises to a peak temperature, and then drops as the mixture is further leaned."

Pilot Information

Certificate:	Private	**Age:**	42,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	June 11, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	October 8, 2007
Flight Time:	339 hours (Total, all aircraft), 138 hours (Total, this make and model), 244 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N1457M
Model/Series:	U206E	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	U20601457
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 5, 2008 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4010 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, activated	**Engine Model/Series:**	IO-550F
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	100 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.79 inches Hg	**Temperature/Dew Point:**	18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Marysville, CA (MYV)	**Type of Flight Plan Filed:**	None
Destination:	Marysville, CA (MYV)	**Type of Clearance:**	None
Departure Time:	12:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	39.5825,-121.563331(est)

Administrative Information

Investigator In Charge (IIC):	Pollack, Wayne
Additional Participating Persons:	Brian Allen; Federal Aviation Administration; Sacramento, CA
Original Publish Date:	April 22, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=73802