Aviation Investigation Final Report

Location:	Corona, California	**Accident Number:**	WPR09LA337
Date & Time:	July 11, 2009, 12:20 Local	**Registration:**	N87295
Aircraft:	ENGINEERING & RESEARCH 415C	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that the airplane's engine began to experience a degradation of power about 15 minutes after takeoff and he maneuvered the throttle to full power in an effort to recover the power loss. The engine rpm increased temporarily and then decreased again, with an eventual total loss of power. During the forced landing, the airplane collided with a house and had come to rest in a field 30 feet from the initial impact. The post accident investigation revealed several anomalies with the engine and modifications that were not in accordance with engine manufacturer's recommended maintenance practices. The owner/pilot reported that the airplane had undergone an annual inspection about eight months prior to the accident and had only flown a couple of hours since. At the conclusion of the examination, the exact cause of the engine failure could not be definitively identified.

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 for undetermined reasons.

Findings

Not determined	(general) - Unknown/Not determined
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
Emergency descent	Controlled flight into terr/obj (CFIT)

HISTORY OF FLIGHT

On July 11, 2009, about 1220 Pacific daylight time, an Engineering and Research 415C, N87295, experienced a loss of power and collided with terrain near Corona, California. The private pilot, the sole occupant, sustained minor injuries; the airplane was substantially damaged. The pilot was operating the airplane under the provisions of 14 Code of Federal Regulations Part 91. The personal flight departed from Flabob Airport, Rubidoux, California, about 1200, with a planned destination of Oceanside, California. Visual meteorological conditions prevailed, and a flight plan had not been filed.

In a written statement, the pilot reported that about 15 minutes after departure, the engine began to experience a degradation of power. He maneuvered the throttle to full power in an effort to recover the power loss. The engine rpm increased temporarily and then decreased to a partial power position. The engine eventually experienced a total loss of power and the pilot maneuvered the airplane to an undeveloped area south of a housing development. Despite his attempts, the airplane did not have enough altitude and collided with the last house in the area (about 1 foot below the roof). The airplane came to rest in a field, about 30 feet from the house, and at the perimeter of the area he was attempting to land.

According to the pilot, the airplane's last annual inspection was completed on November 04, 2008. He stated that the airplane had flown few hours since then and was kept stored in a hangar. A week prior to the flight, he had started the engine and noticed the airplane's gauges did not indicate there was oil pressure. He took the airplane to a mechanic, who apparently fixed the problem. The receipt for the maintenance indicated that three days prior to the accident, a mechanic had performed the following maintenance: replaced the brake pads, replaced the oil temperature sender, added three washers to the oil pressure relief valve, changed the oil filter, and tested the engine "pressure for leaks."

TESTS AND RESEARCH

Following the accident, a Safety Board investigator examined the wreckage at facilities in Chino, California on October 29, 2009 with a representative from Teledyne Continental Motors (TCM). According to the data plate affixed to the crankcase, the powerplant of the accident airplane was a Continental C-90-12, serial number 45340-7-12F.

An external examination was performed of the engine and accompanying accessories. The engine was partially attached to the fuselage and appeared intact. The lower right engine bolt was in place but the rubber mount bushing and associated washer were missing. Signatures on the mount were consistent with the bushing and washer not being in place at the time of the accident.

Visual examination revealed that the carburetor was not attached to the intake manifold. The throttle linkage arm had separated from the carburetor, though remained attached to the control cable. The mixture cable separated from the mixture linkage arm. The mixture cable was affixed to the engine baffling with a fabricated alloy bracket. The bracket was affixed to the carburetor by a single bolt. The baffle had become separated from the single bolt, with the fracture surfaces obscured with a dark oil-like residue. The oil sump had sustained damage to its forward facing side, consistent with impact. The oil filter element had "7-10-2009" written on its side indicating that was the date of the engine last oil change.

The cylinders' combustion chambers were examined through the spark plug holes utilizing a lighted borescope. The combustion chambers remained mechanically undamaged, and there was no evidence of foreign object ingestion or detonation. The valves were intact and undamaged. There was no evidence of valve to piston face contact.

The magnetos were affixed to their respective mounting flanges and appeared intact. Upon rotation of the crankshaft, investigators could audibly detect the impulse coupling activating and observe spark at each ignition lead end. Removal of the upper spark plugs revealed that #1 and #3 plugs were light gray in color. The #2 and #4 spark plug electrode areas had an oily residue. According to the Champion AV-27 chart the electrodes showed (normal) erosion.

Investigators disassembled the fuel pump, the diaphragm was observed to contain cracks in the rubber material on the fuel side, with a small amount of debris in the chamber and on the surface of the filter screen. The fuel pump chamber displayed a thick layer of deposits white in coloration. Investigators cut the fuel line (rubber tubing) from the fuel pump to the header tank. The line was hard and not malleable; additionally, the interior surface was noted to be cracked and brittle. Notations on the external surfaces of the fuel line indicated that it was specified for use as a hydraulic line.

The gascolator was disassembled and no fuel was present; the screen contained a trace amount of debris. The rubber bowl seal appeared to have numerous cracks around its circumference. The bowl contained no debris. The carburetor was disassembled and found to contain a yellow residue film around the bowl. A similar colored film was noted around the outlets of the main fuel nozzle, and accelerating pump outlet orifices.

According to a representative from TCM, the overall engine condition was not consistent to that of an engine that had recently undergone an annual inspection. He additionally stated that there were numerous modifications that were not in accordance with TCM recommended

maintenance practices.

Pilot Information

Certificate:	Private	**Age:**	83,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 With waivers/limitations	**Last FAA Medical Exam:**	October 30, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 27, 2008
Flight Time:	2400 hours (Total, all aircraft), 200 hours (Total, this make and model), 25 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ENGINEERING & RESEARCH	**Registration:**	N87295
Model/Series:	415C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	468
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	C90
Registered Owner:	FLEISHER JACK	**Rated Power:**	90 Horsepower
Operator:	FLEISHER JACK	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RAL	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	12:00 Local	**Direction from Accident Site:**	10°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.92 inches Hg	**Temperature/Dew Point:**	32°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Rubidoux, CA (RIR)	**Type of Flight Plan Filed:**	None
Destination:	Oceanside, CA (OKB)	**Type of Clearance:**	None
Departure Time:	12:00 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:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	33.897499,-117.602218(est)

Administrative Information

Investigator In Charge (IIC):	Keliher, Zoe
Additional Participating Persons:	Jim Coughran; Federal Aviation Administration; Riverside, CA
Original Publish Date:	May 11, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74258