Aviation Investigation Final Report

Location:	Torrance, California	**Accident Number:**	WPR20LA094
Date & Time:	February 25, 2020, 12:20 Local	**Registration:**	N3437H
Aircraft:	Ercoupe 415	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While the pilot was conducting touch-and-go takeoffs and landings, the airplane's engine lost partial power about 200 ft above ground level and began surging. The pilot performed a 90° left turn to land on a taxiway. After touchdown, the airplane veered left and collided with two parked airplanes.

Examination revealed that manipulation of the throttle control in the cockpit did not correspond with the complete butterfly valve deflection in the throttle body. The limited motion of the throttle cable was likely the result of the movement of the cable's outer housing (sheath) and/or loose rigging resulting in the cable bowing.

Probable Cause and Findings

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

The partial loss of power due to a malfunction of the throttle cable, which limited movement of the throttle body.

Findings

Aircraft	Fuel control/carburetor - Malfunction
Aircraft	Fuel controlling system - Inoperative

Factual Information

History of Flight

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

On February 25, 2020, about 1220 Pacific standard time, an Ercoupe 415C, N3437H, was substantially damaged when it was involved in an accident near Torrance, California. The pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations Part* 91 personal flight.

The pilot stated that following departure, she completed two touch-and-go practice takeoffs and landings. During the third takeoff, when the airplane had traveled about 3/4 of the length of runway 29R, at an altitude of about 200 ft above ground level (agl), the engine experienced a partial loss of power and surged. The pilot performed a 90º left turn to land on a taxiway. After touchdown, the airplane veered left and collided with two parked airplanes.

Examination revealed no evidence of a catastrophic engine failure. The magneto timing was -2° and -4° than recommended by the manufacturer. Continuity of the fuel system was verified. The engine was rotated with no anomalies found.

The throttle cable was secured at both ends: to the arm on the carburetor and to throttle lever in the cockpit. Movement of the throttle arm revealed that the throttle control in the cockpit did not correspondingly retard aft initially. Further examination of the cable revealed that from the throttle arm, the rod was secured with an Adel clamp to the engine mount. About 3/4-inch of movement of the arm produced movement of the rod that would move the clamp and outer housing (sheath) of the cable; however, the cable would not move (and, in turn, move the throttle control) unless the arm was moved in excess of 3/4-inch. This was confirmed by using a borescope to evaluate the butterfly valve position in the throttle body. The amount of forward and aft play in the throttle control showed that, in relation, the butterfly of the carburetor would deflect roughly 10° to 15° at full throttle and 20° to 25° at half throttle. Additionally, the rigging of the throttle cable from the panel to the throttle arm could have resulted in the rhythmic surging of the engine. If the throttle cable hits the stop at the carburetor end before the throttle knob hits the panel, a “bowing” may occur in the throttle cable. When bowed, the cable can act similar to a spring that is unable to provide the intended movement unless aligned.

The supplemental type certificate (STC) holder, Univair, was not able to determine where exactly the throttle cable’s clamp, part number, 415-40506, was designed to attach.

There are several other recorded instances when similar circumstances have occurred in Ercoupe airplanes.

CHI08CA056: Ercoupe 415D – The NTSB determined the probable cause was a loose clamp on the throttle cable which prevented application of engine power.

BFO94LA001: Ercoupe 415E – The NTSB determined the probable cause was the failure of the airplane's throttle cable fitting due to undetermined reasons, which prevented the pilot from applying power above engine idle.

NASA Aviation Safety Reporting System (ASRS) Report 698127: Ercoupe 415C – The report stated that during landing, the engine began surging and they landed on a highway. A post accident examination revealed that "a bracket securing the throttle cable was loose and that this could have allowed the throttle arm on the carburetor to move and thus cause the surging we experienced."

Pilot Information

Certificate:	Private	**Age:**	69,Female
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Sport pilot Without waivers/limitations	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 25, 2018
Flight Time:	(Estimated) 581 hours (Total, all aircraft), 350 hours (Total, this make and model), 5 hours (Last 90 days, all aircraft), 2.4 hours (Last 30 days, all aircraft), 0.4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Ercoupe	**Registration:**	N3437H
Model/Series:	415 C	**Aircraft Category:**	Airplane
Year of Manufacture:	1946	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4062
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	February 7, 2020 Annual	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	Reciprocating
Airframe Total Time:	1749.4 Hrs as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:	C91 installed, not activated	**Engine Model/Series:**	C-85
Registered Owner:	On file	**Rated Power:**	85 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:	KTOA,90 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:		**Direction from Accident Site:**	252°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.17 inches Hg	**Temperature/Dew Point:**	24°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Torrance, CA (TOA)	**Type of Flight Plan Filed:**	None
Destination:	Torrance, CA (TOA)	**Type of Clearance:**	VFR
Departure Time:	12:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Zamperini Field TOA	**Runway Surface Type:**	Asphalt;Concrete
Airport Elevation:	103 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	29R	**IFR Approach:**	None
Runway Length/Width:	5001 ft / 150 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	33.803054,-118.338058

Administrative Information

Investigator In Charge (IIC):	Keliher, Zoe
Additional Participating Persons:	Josef Babati; Federal Aviation Administration; Long Beach, CA
Original Publish Date:	March 11, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100999