



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety Alaska Region

On Scene, Airframe and Engine Examination Summary

October 30, 2017

Noreen Price, Aviation Accident Investigator

A. Accident

NTSB Number: ANC17LA034

Location: Anchorage, Alaska

Date: July 9, 2017

Aircraft: N2429C, Cessna 180

Engine: Continental IO-520-D34A

B. Participants/Party Members

Noreen Price	NTSB Investigator-in-charge (IIC)
Peter Alexakis	Federal Aviation Administration IIC
Nicole Charnon	Continental Motors Inc, Sr. Air Safety Investigator (engine exam only)
Henry Soderlund	Textron Aviation, Sr. Air Safety Investigator (airframe exam only)

C. Background

On July 9, 2017, about 1220 Alaska daylight time, a float-equipped Cessna 180 airplane, N2429C, sustained substantial damage when it collided with a house during an emergency landing in a residential neighborhood shortly after takeoff from the Lake Hood Seaplane Base (LHD), Anchorage, Alaska. The airplane registered to the pilot and was being operated as a personal flight under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91 and visual flight rules (VFR).

The airline transport pilot, the sole occupant, sustained minor injuries, and there were no injuries to those on the ground.

The pilot stated that during climb out he attempted to retract the flaps, but the flap handle would not move. He elected to return to the airport to land and investigate. The pilot reported that while on the downwind leg, at an altitude of 600 feet, and while flying at 70 knots, the engine lost total power, and he selected an open field in a park that was surrounded by a residential neighborhood as a forced landing site. While maneuvering the airplane to the open field, the airplane descended into an adjacent neighborhood. After striking a tree, a light pole, a vehicle, and a duplex, the airplane wreckage came to rest on a residential street. The duplex was located at 3311 Cosmic Circle, Anchorage. The airplane sustained substantial damage to the wings, fuselage, engine firewall and empennage. The pilot sustained a cut to his head during the impact and successfully egressed the wreckage. Refer to figures 1 and 2.



Figure 1. First responders defueling the airplane at the scene and the damaged house, (yellow arrow).

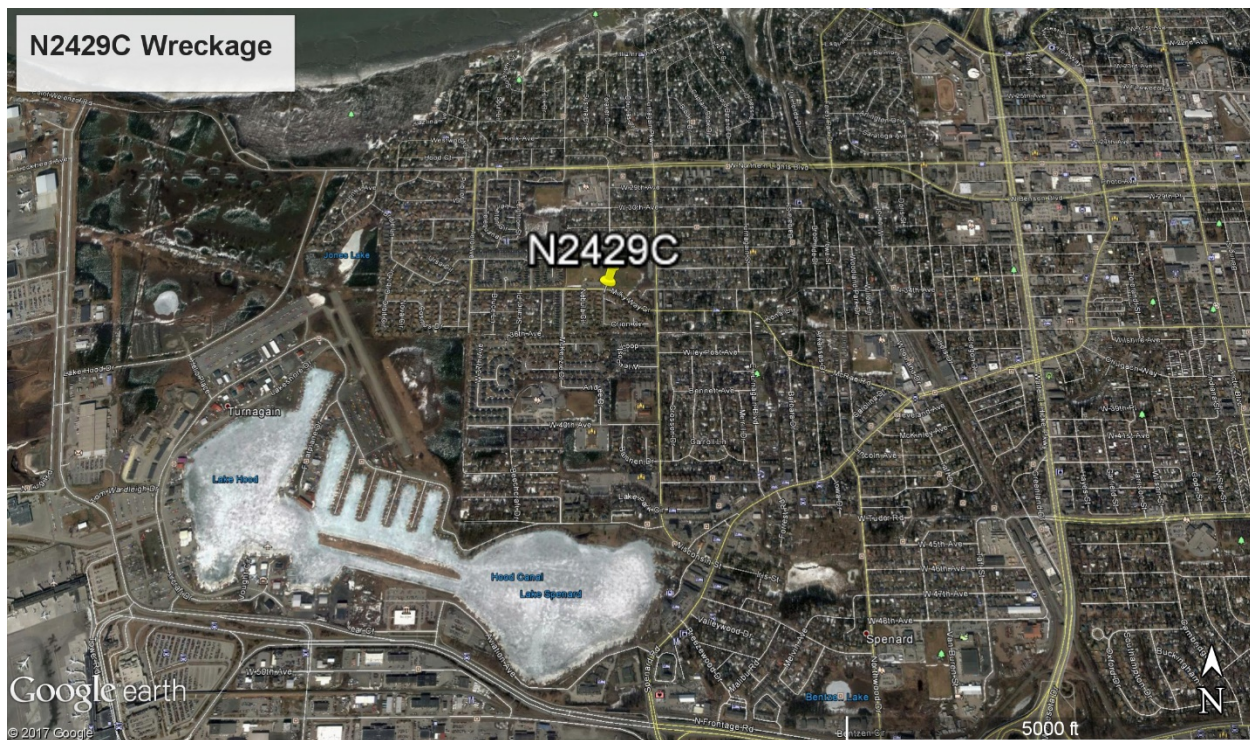


Figure 2. Wreckage location north of LHD.

D. On Scene Examination

The on-scene examination revealed that the airplane impacted the street in an upright attitude with the right wing down and the floats folded under the airplane to the left. It rested on the bottom of the fuselage on a heading of 236°. The airplane was in the middle of Orion Circle near the intersection of Milky Way Drive. The Anchorage Airport Police and Anchorage Police and Fire Departments responded. There was a constant leak of fuel from fractured fuel lines at wing roots. The fire Department applied putty to the fractures to terminate the fuel leaks prior to the NTSB IIC arrival.

International Aviation Services pumped out the fuel tanks to prevent further spillage. Fuel samples from right and left tanks were consistent with 100LL avgas and were visually tested clear of water and debris. The fuel selector was in the off position and the fuel caps were secure in place.

The airplane wreckage and impact evidence began at the top of a 40-foot spruce tree and continued on a course of about 320° to a downed light pole, a house gutter and window impact, a second story bedroom structure, a shed roof, and a pickup truck parked in the road and then the street. The wreckage debris pattern was about 200 feet long. See figures 3 and 4. The airframe had impact indentations on the leading edge of both wings that were consistent with impact damage to ground objects at the scene. The composite propeller blades were fractured and fragmented into pieces found through most of the debris field. The pilot's 4-point seat harness was intact and functional. The the right seat (which had no occupant) headset cord was wrapped around the base of the flap control lever, which was in the 20° detent. The right seat lap belt was not fastened and located near the flap lever base after the accident. See figure 5. Wood debris from the house and shed was present in and around the airplane. All the airplane's major components were found at the accident site.

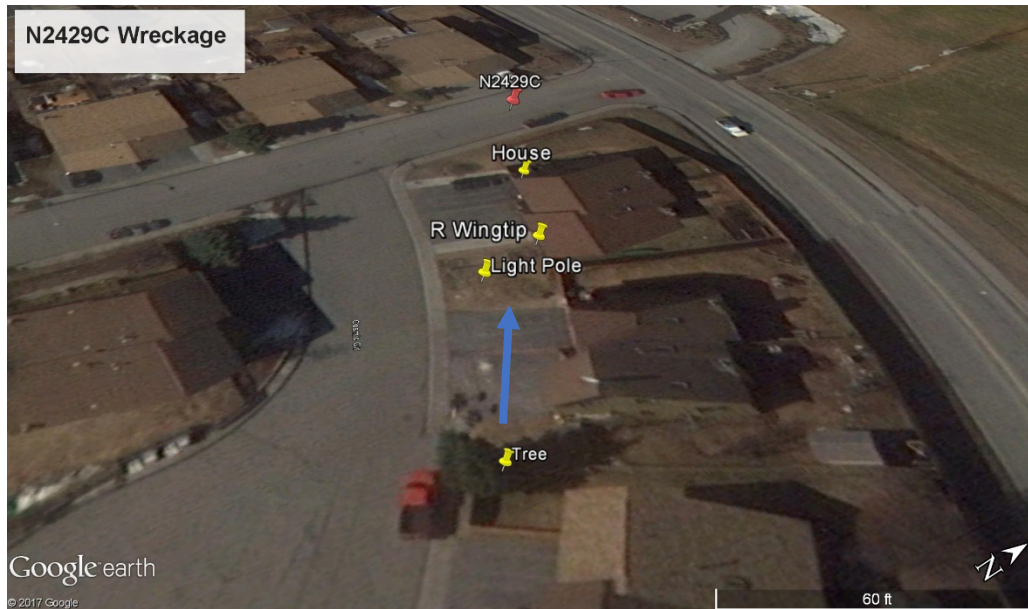


Figure 3. Impact sequence.



Figure 4. Damaged house and shed.

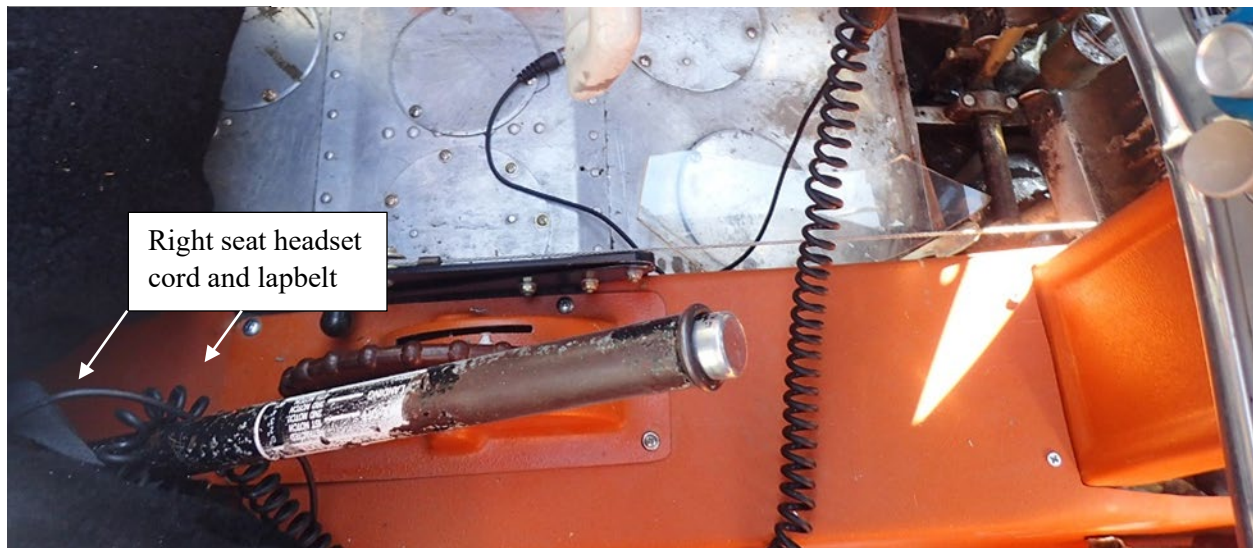


Figure 5. The flap handle with right headset cord and lap belt.

E. Airframe Examination (Cessna 180, S/N 30729)

The McKenna Brothers Paving company recovered the wreckage and relocated it to the secure Seaplanes North lot. An airframe examination was conducted on July 13, 2017, with the assistance of a Textron aviation safety investigator.

Fuel lines from the wings to the airframe were fractured and cut at the wing roots during impact and recovery. The fuel lines from the wing roots to the firewall were continuous and secure. Fuel remained in the header tank and gascolator fuel filter drain. The fuel selector valve functioned properly in OFF, LEFT, BOTH and RIGHT. Fuel was drained from lines at the fuel filter and appropriate air venting observed. There were no restrictions or fuel debris observed. All lines to the engine appeared intact and finger tight.

The electric fuel boost pump was tested for functionality during the engine exam on August 3, 2017. The delivery port was opened up and battery power was applied, and the pump was activated by the low and high switches. Fuel was observed being positively pumped out the delivery side of the pump for 3 seconds and then power was secured.

Flight control continuity was verified from the cockpit controls to the elevators and rudder control surfaces. Aileron control continuity was established from the top of the door post out through the cables to each bell crank and push rod to the control surfaces. The right-wing aileron cable was fractured at the upper door post with broom straw signatures indicative of tension overload separation.

The flap handle moved through all detents without restriction. There was some binding at the retracted position (full down) due to impact deformation in the bracket and floorboards. The right-wing flap cable separated near the wing root and exhibited broom straw signatures indicative of tension overload failure. The left flap control continuity was established from the wing root cut ends to the bellcrank and pushrod.

The 4-point shoulder harnesses were secure on the overhead and the seatbelt buckles were intact and all webbing was in good condition. Neither front seat rails had required rail stops installed, (AD 2011-10-09).

F. Engine Examination (Continental IO-520-D34A, S/N 572-640)

The wreckage was relocated to a hangar in Wasilla and a detailed engine examination was conducted on August 3, 2017, with assistance from a Continental Motors aviation safety investigator. After the examination, the engine was removed and shipped to the Continental Motors engine test facility in Mobile Alabama.

Two of the engine mounts were fractured and engine was intact with all lines attached and finger tight. There was some evidence of oil on the forward left bottom of the engine. The propeller governor control shaft was fractured and bent rearward. There were no signs of fuel leaks. The crank case and cylinders were all secure with no leaks present. See figure 6. The induction and exhaust systems exhibited minor impact damage. Engine control continuity was verified from the cockpit to the throttle valve/metering unit. All spark plugs exhibited normal wear signatures with little or no combustion deposits. Thumb compressions were verified on all six cylinders. The ignition harness was intact and both magnetos secure in their respective mounting pads. Spark was produced in proper firing order when the crank shaft was rotated. The cylinders, pistons, valves, and bottom spark plugs were examined with a lighted borescope. There were no anomalies observed, except for debris in the #6 cylinder and a fractured #6 rocker cover, which corresponded to impact damage and a slightly stuck exhaust valve that moved once tapped with a soft mallet. The oil sump remained attached with some impact damage evident on the bottom. Oil was drained from the sump.

The fuel lines were intact and secure at their fittings. The engine driven fuel pump was attached and secure with no sign of leaks. The fuel inlet line to the metering unit was removed and fuel was observed pouring out. The fuel inlet screen was removed and noted as clean with no obstructions. The fuel manifold valve remained attached to the topside of the engine and the fuel injection lines were in place. The cap of the fuel manifold was removed, and a very small amount of residual fuel was observed beneath the plunger. The plunger and diaphragm remained intact and no obstructions were on the screen. The fuel line from the fuel flow transducer to the manifold valve was opened and no fuel was present. Air was blown through the fuel flow transducer with no obstructions noted.

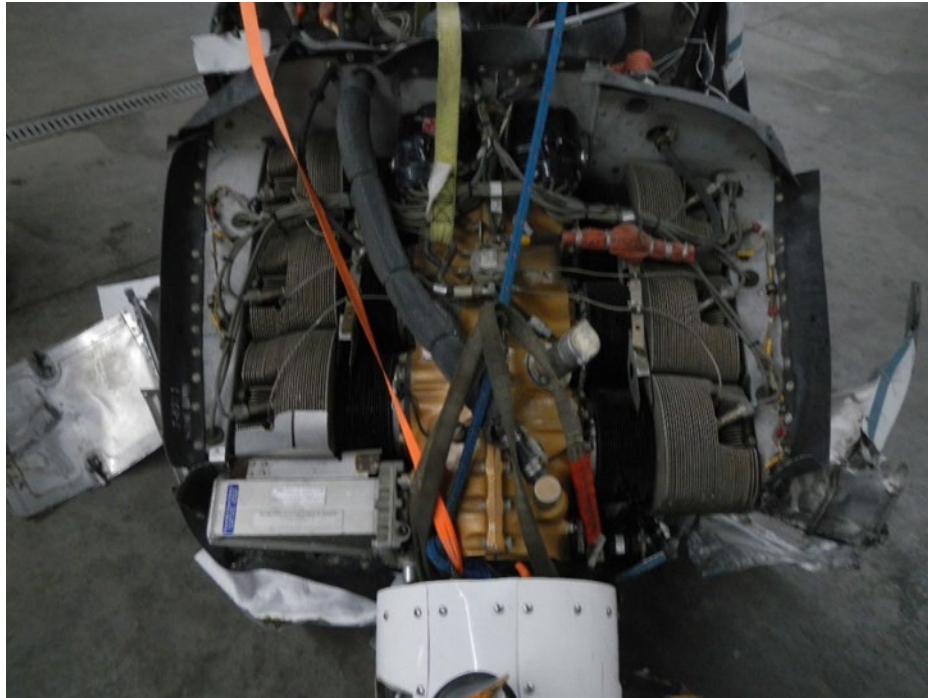


Figure 6. Continental IO-520 before the engine examination.

An engine test run was conducted on November 6, 2017. The cooling baffle, alternator, vacuum pump, propeller governor and exhaust risers were removed. The engine mount legs, balance tube, intake elbow, 2 rocker covers, and 2 ignition leads were replaced due to impact damage. A test club propeller was installed. The engine started with no hesitation and was warmed up and then operated through various power settings from idle to full power at 5-minute intervals. The magnetos were tested at 2100 rpm and responded within limits. The throttle was rapidly moved from idle to full power multiple times with no hesitation noted. See figure 7. No preaccident anomalies were identified that would have precluded the engine's ability to produce full rated power.

ENGINE RUN PARAMETERS																
Time		RPM	MP / TDP " Hg	Oil		Fuel				Cell ° F	Cylinder Head Temperature ° F					
Reading	Minutes			PSI	° F	Lbs/Hr	Nozzle PSI	Pump PSI	Fuel ° F		# 1	# 2	# 3	# 4	# 5	# 6
1	5	1200	16.94	55	110	27.0	5.56	13.62	73	71	216	238	223	234	177	179
2	5	1600	18.84	50	144	44.8	6.33	16.54	74	72	262	256	249	267	219	192
3	5	2100	21.67	48	162	76.9	9.10	23.08	75	72	326	288	282	263	297	229
4	5	2450	24.13	40	185	99.4	11.84	28.01	76	72	376	324	312	305	363	271
5	5	F/T 2850	28.59	36	--	139.8	18.22	34.09	78	72	394	411	337	371	422	312
6	5	Idle 700	16.90	16	--	12.05	5.19	10.78	75	74	261	258	221	228	212	176
7	The throttle was rapidly moved from idle to full power on multiple occasions with no missing or anomalies noted.															
Ambient Air Temperature °F		Ambient Air Pressure		Transfer Collar Δ P		Maximum Rated Power Engine Operational Parameters										
72.2		29.39		IN	OUT	RPM		" Hg MP		Fuel Flow Lbs/Hr		Metered PSI		Unmetered PSI		
				37	38	2850		28.59		143-153		17.0-19.4		30.0-33.0		
Notes: Operator – Lisa Jersild, 40810. Transfer collar pressure delta measured at full throttle power setting.																
Engine Performance Test																
Test RPM	Left Magneto		Left Magneto		Right Magneto		Right Magneto									
	RPM		RPM Drop		RPM		RPM Drop									
2100	2016		84		2004		96									

Figure 7. Engine test run data.

G. Maintenance Records

A review of the airplane's logbooks revealed the most recent documented annual inspection was July 2, 2013, and the engine was overhauled March 12, 2009. The tachometer displayed 1,943.81 hours during the examination. The EI digital tachometer indicated 224.8 hours.

Engine Total Time: 3,591.71 hours

Engine Time Since Overhaul: 260.21 hours

Airframe Total Time: (last documented inspection) 4,156.03 hours

H. Summary

The postaccident examinations of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. It was not determined whether the loose right headset and lapbelt may have interfered with flap lever movement before the accident, but it was unlikely that they interfered with engine operation.