



National Transportation Safety Board Aviation Accident Final Report

Location:	Howell, Michigan	Accident Number:	CEN19FA279
Date & Time:	August 20, 2019, 11:18 Local	Registration:	N200HS
Aircraft:	Aero Commander 200	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The single-engine airplane had undergone recent maintenance, including the installation of a field-overhauled engine and a three-bladed propeller. The pilot and pilot-rated passenger were conducting a maintenance check flight. One witness reported that the airplane took off normally, but when it reached between about 200 to 300 ft above ground level, it stopped climbing. Another witness reported that he did not hear the engine but that he could not remember whether the propeller was turning.

The accident engine was a modification to the airplane's original configuration. Such a modification is typically recorded on a Federal Aviation Administration Form 337, "Major Repair and Alternation," and adopted by a field approval. However, neither the form nor maintenance records regarding the installation of the modified engine were found during the investigation.

A smart phone recorded two videos from inside the airplane. One of the videos captured the accident flight just after takeoff. Several seconds later, a decrease in engine sound was heard, followed by a momentary warning horn. One of the occupants then stated, "we're stalling," followed by the sound of the stall warning horn and impact with terrain.

Examination of the airplane revealed substantial damage to the wings and fuselage. During examination of the engine, the air filter element was found displaced and lodged in the intake. The metal screen used to hold the filter element was found improperly installed. The evidence indicates that the improper installation of the metal screen allowed the filter element to become displaced and subsequently lodged in the intake, which blocked the intake air and resulted in a total loss of engine power.

Probable Cause and Findings

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

The improper installation of the engine's metal intake screen, which allowed the filter element to become displaced and subsequently lodge in the intake, blocking intake air and causing the total loss of engine power, at low altitude and low airspeed resulting in the airplane impacting terrain.

Findings

Aircraft	Air intake - Design
Aircraft	(general) - Incorrect service/maintenance
Aircraft	Airspeed - Attain/maintain not possible
Aircraft	Altitude - Attain/maintain not possible

Factual Information

History of Flight

Takeoff	Loss of engine power (total) (Defining event)
Landing	Collision with terr/obj (non-CFIT)

On August 20, 2019, about 1118 eastern daylight time, an Aero Commander (Meyers) 200D airplane, N200HS, was substantially damaged when it was involved in an accident at the Livingston County Spencer J Hardy Airport (OZW), Howell, Michigan. The pilot and pilot-rated passenger were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The airplane had undergone recent maintenance, during which the passenger had installed a field-overhauled engine and a three-bladed propeller. The pilot, who was seated in the left seat, and passenger, who was seated in the right seat, were conducting a postmaintenance check flight.

The accident flight was the second flight of the day in the accident airplane. Before the first flight, the airplane was filled with 34.4 gallons of fuel. It could not be determined if any adjustments or maintenance items were accomplished on the airplane after the first flight and before the accident flight.

One witness reported that the airplane took off normally from OZW, but when the airplane was between about 300 and 400 ft above ground level, it stopped climbing. One witness reported that it looked like the airplane tried to turn back to the runway before entering a rapid descent.

Another witness reported that he did not hear the engine but that he could not remember whether the propeller was turning.

A review of the airport security video that captured the airplane's departure revealed that it began climbing but then stopped. The airplane then entered a slight descent before it disappeared out of the camera's view. Another camera captured the airplane rapidly descending just before it impacted terrain.

A smart phone recorded two videos from inside the airplane. One of the videos captured the accident flight starting just after takeoff. Several seconds later, a decrease in the engine sound was heard, followed by a momentary warning horn. One of the occupants then stated, "we're stalling," which was followed by the sound of the stall warning horn and impact with terrain.

Pilot Information

Certificate:	Airline transport	Age:	64
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	June 7, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	22974 hours (Total, all aircraft), 518.9 hours (Total, this make and model)		

Pilot-rated passenger Information

Certificate:	Commercial	Age:	64
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Lap only
Instrument Rating(s):		Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:	Class 3 None	Last FAA Medical Exam:	October 4, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Aero Commander	Registration:	N200HS
Model/Series:	200 D	Aircraft Category:	Airplane
Year of Manufacture:	1966	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	338
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:	November 12, 2015 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	Reciprocating
Airframe Total Time:	1069.3 Hrs as of last inspection	Engine Manufacturer:	Continental
ELT:	C91A installed, activated, did not aid in locating accident	Engine Model/Series:	IO-550-F
Registered Owner:		Rated Power:	
Operator:	On file	Operating Certificate(s) Held:	None

The airplane was originally equipped with a Continental IO-520-A engine and a McCauley two-bladed propeller. The airplane was modified by the installation of a Continental IO-550-F engine and a McCauley three-bladed propeller. The engine and propeller modification is typically recorded on a Federal Aviation Administration (FAA) Form 337, “Major Repair and Alternation,” and adopted by a field approval. Neither the form nor maintenance records regarding the modification were found during the investigation.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KOZW	Distance from Accident Site:	
Observation Time:	11:39 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 8500 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	140°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.05 inches Hg	Temperature/Dew Point:	28° C / 21° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Howell, MI (KOZW)	Type of Flight Plan Filed:	None
Destination:	Howell, MI (KOZW)	Type of Clearance:	None
Departure Time:		Type of Airspace:	

Airport Information

Airport:	Livingston County Spencer J Ha KOZW	Runway Surface Type:	
Airport Elevation:	962 ft msl	Runway Surface Condition:	Dry;Vegetation
Runway Used:	13	IFR Approach:	None
Runway Length/Width:	5002 ft / 100 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	42.624721,-83.973335

The airplane impacted terrain and came to rest about 600 ft beyond the departure end of runway 13. Examination of the airplane revealed that the forward cabin/cockpit area, fuselage, and both wings exhibited impact damage. All the major airplane components were located at the crash site. Two of the three propeller blades came to rest in the main wreckage path, and the third blade remained in the propeller hub and engine. No postcrash fire ensued.

Control continuity was established from the cockpit to the elevator and rudder. Aileron continuity was continuous from the cockpit to the left and right aileron bellcranks. The landing gear and flap handles were in the “down” position, and damage to the wings near the landing gear struts was consistent with the gear being extended during the accident. The front seats were equipped with only a lap belt.

Examination of the engine revealed that the air filter element was displaced and lodged in the intake tube (see figures 1 and 2).



Figure 1: Engine intake

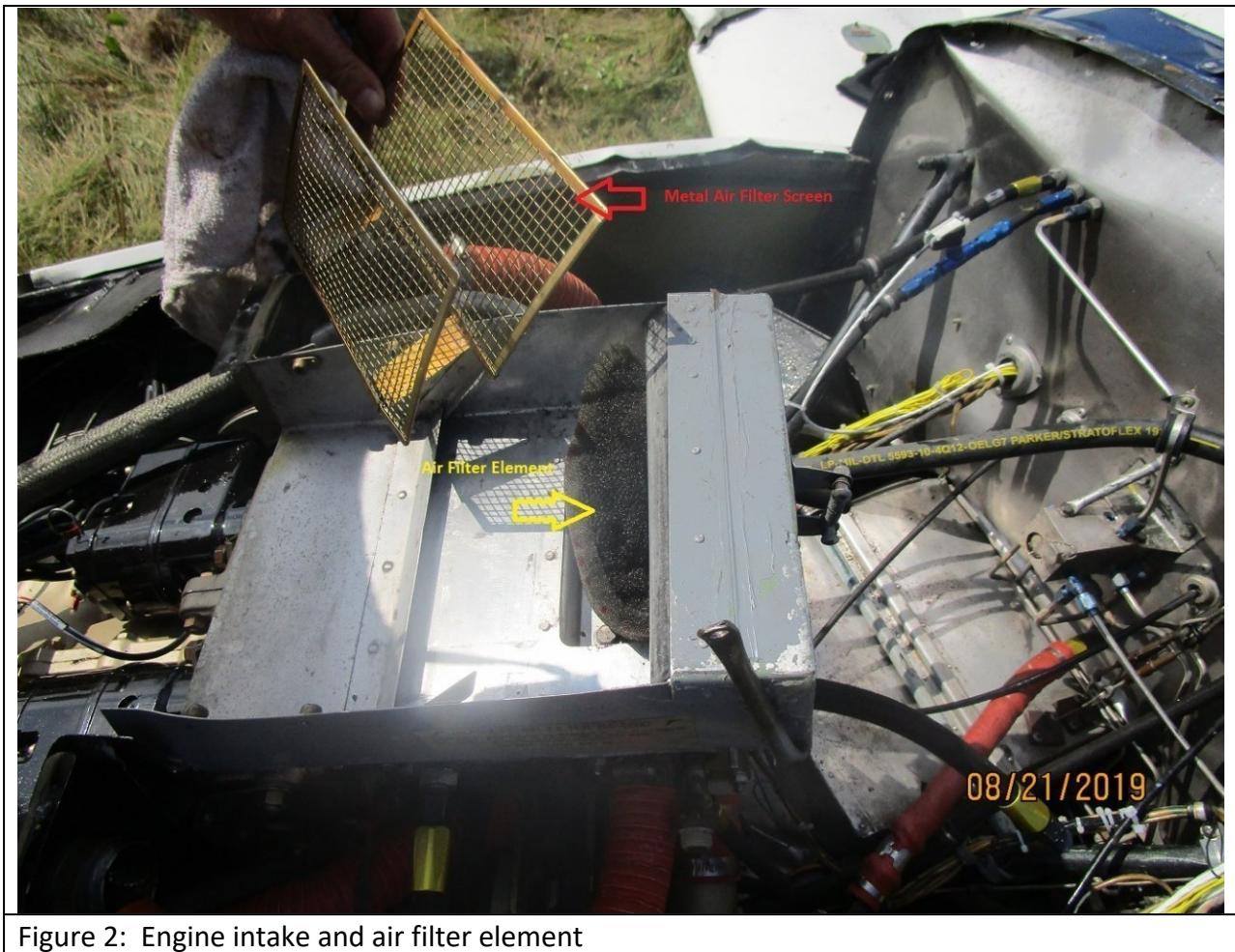


Figure 2: Engine intake and air filter element

The engine crankshaft was rotated by hand. Compression and suction were obtained for all cylinders at the top spark plug openings. Internal engine continuity was confirmed through the valve train and to the accessory section. When the engine was rotated, a snap/click sound was heard from two magneto impulse couplings, and spark was observed from each top ignition lead. The engine-driven fuel pump was intact, and the drive shaft rotated freely when operated by hand. The top set of sparkplugs exhibited dark-colored combustion deposits and normal electrodes. Cylinder Nos. 4 and 6 exhibited evidence of carbon fouling.

Medical and Pathological Information

The Michigan Medicine Pathology and Clinical Laboratories, Ann Arbor, Michigan, under the authority of the Livingston Country Medical Examiner, conducted an autopsy on the pilot. The cause of death was determined to be "multiple traumatic injuries."

The FAA's Forensic Sciences Laboratory, Oklahoma City, Oklahoma, conducted toxicological testing of specimens from the pilot. The tests were negative for ethanol and carbon monoxide and positive for doxylamine and dextromethorphan, which are over-the-counter medicines often used to treat cold or allergy symptoms.

Tests and Research

The airplane was equipped with a JPI engine monitor, and the data were downloaded.

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig		
Additional Participating Persons:	Donald S Brown; FAA FSDO; Detroit, MI Michael Council; Continental Aircraft Engines; Mobile, AL		
Original Publish Date:	September 16, 2021	Investigation Class:	3
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=100102		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).