



Beechcraft

BY TEXTRON AVIATION

Air Safety Investigations Aircraft Incident/Accident Technical Report

Aircraft Incident/ Accident Information	Year: 1955	Make: Cessna	Model: 180
	Serial number: 31976		Registration: N3178D
Location: Harrisburg, PA		Date: 05-31-23	Time: 1435 EDT
Aircraft Owner		Aircraft Operator	
Kenneth Allen Sager [REDACTED] Hummelstown, PA 17036-8900		Same as Aircraft Owner	
Report Information			
Senior Air Safety Investigator: Ernest C. Hall		Report #: ASI-23-BF-T	Report date: 10-23-23

Airframe

Impact Sequence and Airframe Structure

According to the FAA, the aircraft touched down on the terrain, bounced, and then traveled up an interstate ramp embankment impacting the passenger door of a utility maintenance truck. The propeller/engine impacted the maintenance truck passenger door. The left wing contacted the maintenance truck bucket structure aft of the passenger door. The engine was canted to the right and up.

Airframe Systems

Flight Control System Information		
Control lock: Not installed		
Flight Control Cable Continuity		
Ailerons: Established	Elevators: Established	Rudder: Established
Aileron tab: Not applicable	Stabilizer: Established	Rudder tab: Not applicable
Flap and Trim Positions		
Flap indicator: Not applicable	Flap handle: See below	Flap actuator: Not applicable
Stabilizer trim: Indicator: Unknown due to damage		Actuators: See below

Remarks:

All primary (elevators, ailerons, and rudder) flight control surfaces and flaps were accounted for at the wreckage examination. Continuity of all primary flight control cables were confirmed from the cockpit to their respective flight control surface. Continuity was confirmed by either visual and/or pulling the cable at one end to see the other same cable end and/or control surface move.

The flap drive cables continuity was confirmed from the cockpit manual flap handle to each wing flap with cut signatures consistent with recovery cuts at each wing root and approximately 15" aft of the engine firewall.

The aileron flight control cables exhibited cut signatures consistent with recovery cuts at each wing root and approximately 15" aft of the engine firewall.

The rudder and elevator flight control cables exhibited cut signatures consistent with recovery cuts approximately 15" aft of the engine firewall.

Continuity of the stabilizer trim control cables were confirmed from the cockpit to the stabilizer with cut signatures consistent with recovery cuts approximately 15" aft of the engine firewall. Both stabilizer actuators extensions were measured and found to be approximately 6", which corresponds to approximately 0 ° (neutral) position.

Airframe Fuel System Condition, Controls, and Read Outs		
Fuel strainer screen: Undetermined	Fuel strainer bowl: Undetermined	
Main fuel tank gauge:	Left: Empty	Right: Empty
Fuel selector handle: Left	Fuel selector valve: Left	

Remarks:

According to the NTSB, the aircraft departed from Farmers Pride Airport (9N7), Fredericksburg, PA, with 55 gallons of usable fuel, two occupants, and no luggage.

According to the NTSB, first responders reported to the FAA on scene that there was no evidence of fuel or fuel spillage at the accident site, but that there was an odor of fuel. According to the FAA, at the accident site, there was only about one pint of fuel in the right wing and no fuel in the left wing.

According to the NTSB, a witness at Farmers Pride Airport (9N7), Fredericksburg, PA, reported they saw, from afar, the accident aircraft at the self-service fuel pump. The fuel station was a club/group self-service, key-operated, which is paid every three months. The fuel bought at the pump is a rolling total; not dated, time stamped, or individual amount recorded. The quantity of fuel bought was not tracked.

The fuel strainer assembly was observed attached to the engine firewall, but the strainer bowl and filter/screen were not observed.

Landing Gear System Condition and Controls			
Gear position:	Nose: Fixed	Left: Fixed	Right: Fixed
Environmental System Controls and Read Outs			
Cabin heater: Full in	Cabin vent: Full in	Defrost: Undetermined	
Air conditioner: Not applicable	Oxygen system: Not applicable	Oxygen quantity: Not applicable	
Icing System Information and Switches			
Certified into known icing? No		De-icing boots installed? No	
Pitot heat: Undetermined		Stall heat: Not applicable	
Anti-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable
ELT Information			
Installed? Yes	Manufacturer: Narco Avionics	Model: ELT 10	Type: (P), (AP), (AF)
Serial number: 31881	Battery due date: 11-24	Armed: Yes	Activated: Undetermined

Remarks:

None.

Cabin and Equipment/Furnishings

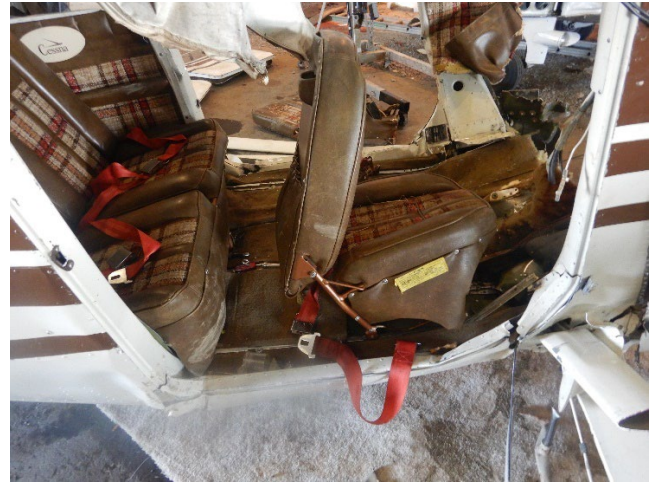
Restraint System Information						
Seat	Occupied	Restraint type	Restraint used	Condition	Manufacturer	2nd seat stop
1	Yes	2-Point	Undt	Partially cut	Non-OEM	Yes
2	Yes	2-Point	Undt	Intact	Non-OEM	No
3	No	2-Point	No	Intact	Non-OEM	Not applicable
4	No	2-Point	No	Intact	Non-OEM	Not applicable

Seat Condition Information					
Seat	Orientation	Feet intact	Back intact	Base intact	Rail intact
1	Forward facing	Partially	Partially	Partially	Partially
2	Forward facing	Partially	Partially	Partially	Partially
3	Forward facing	Not applicable	Yes	Yes	Not applicable
4	Forward facing	Not applicable	Yes	Yes	Not applicable

Remarks:



#1 Seat – ASI-23-BF-122



#2 Seat – ASI-23-BF-105



Bench Rear Seat – ASI-23-BF-101

Instrument Panel

Navigation Instruments							
Analog primary instruments				Autopilot type: Undetermined			
Suction gage: 0		Magnetic compass: Undetermined		Clock: ~ 1:50			
	Left side				Left side		
Airspeed:	~ 2			Turn coordinator (airplane):	90°		
Attitude (pitch):	~20° nose high			Turn coordinator (ball):	Undetermined		
Attitude (roll):	~ 1° right			Heading indicator:	115°		
Altimeter:	Undetermined			Heading "bug":	Undetermined		
Altimeter setting:	Undetermined			Vertical speed indicator:	~1,950' down		
Communication and Navigation Radios							
Radio	Control	Active frequency	Stand-by frequency	Radio	Control	Active frequency	Stand-by frequency
Com 1:	Undt.	Undetermined	Undetermined	Com 2:	Undt.	Undetermined	Undetermined
Nav 1:	Undt.	Undetermined	Undetermined	Nav 2:	Undt.	Undetermined	Undetermined
Obs 1:	Undetermined			Obs 2:	Undetermined		
Transponder:	Mode: Undetermined		Active code: Undetermined		Stand-by code: Undetermined		
Electrical Switch Positions							
Master battery: Undetermined		Alternator: Undetermined		Avionics 1: Undetermined			
Lighting Switch Positions							
Navigation: Undetermined		Rotating Beacon: Undetermined		Landing: Undetermined			
Taxi: Undetermined		Strobe: Undetermined		Instrument: Undetermined			
Ignition Switch Position							
Key: See below							

Remarks:

The right ADF indicator needle was at 290°.

The altimeter separated from the instrument panel and was not observed.

According to the FAA, the key was in the BOTH position and they turned the key to the OFF position.

Powerplant Description

Engine Instruments						
Hour meter:	1,975.9	Tach RPM:	See below	Tach hours:	2,700.96	
Oil press:	~ 10 psi	Oil temp:	Off scale low	EGT:	Digital	
Ammeter:	~10 amps					
Engine Control Positions						
	Cockpit	Engine		Cockpit	Engine	
Throttle:	Pushed in	Undetermined	Cowl flaps:	Undetermined	Undetermined	
Mixture:	Pushed in	Undetermined	Carburetor heat:	Closed/ Pushed in	Undetermined	
Propeller:	Pushed in	Undetermined	Primer:	Undetermined		
Engine Condition						
Engine attached to airframe:			Partially	Propeller attached to engine:		
Engine compression:			See below	Valve train continuity:		
Vacuum pump drive shaft:			See below			
Engine Fuel System Condition						
Fuel pump drive shaft:			See below	Carburetor inlet screen:		
Magneto Condition						
Left magneto attached:			Yes	Right magneto attached:		
Left magneto spark:			See below	Right magneto spark:		
Spark Plug Condition (per Champion Check-A-Plug Card)						
	1	2	3	4	5	6
Top	See below	See below	See below	See below	See below	See below
Bottom	See below	See below	See below	See below	See below	See below

Remarks:

The tach indicator needle was separated from the indicator. The manifold pressure indicator separated from the instrument panel. The faceplate separated from the indicator case.

The engine exhibited minimal impact damage. Cylinder #5 valve cover had a hole in the side, the starter separated from its attachment point, and the oil pan had a hole at the drain plug. The throttle control cable remained attached to the carburetor throttle control arm that was separated from the carburetor. The carburetor control linkage was actuated, and fuel sprayed out of the accelerator pump jet.



Cropped – Front Engine – ASI-23-BF-131



Cropped – Back Engine – ASI-23-BF-133

Propeller

The McCauley 2-bladed constant speed propeller remained attached to the engine crankshaft propeller flange. One blade was bent aft to the non-camber side about 11" from the root. The other blade exhibited a slight twist and bend aft to the non-camber side.



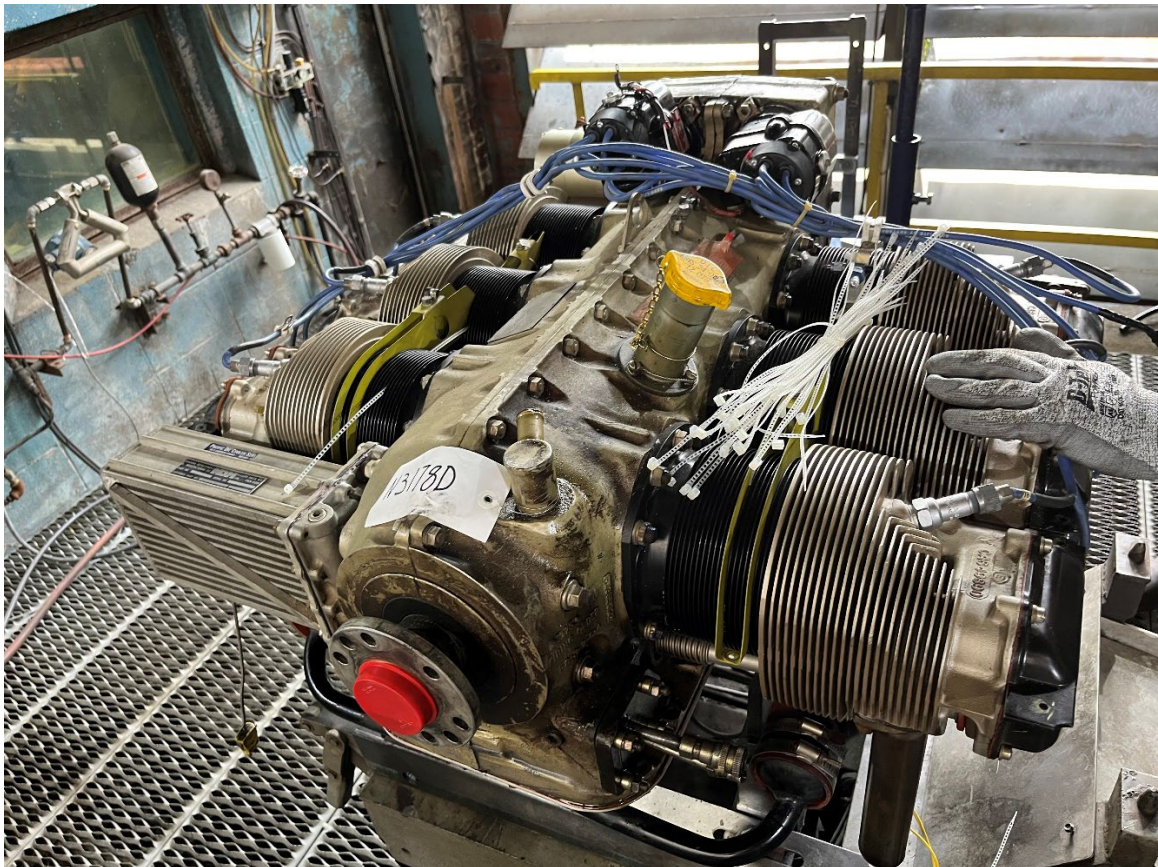
Cropped – McCauley Propeller – ASI-23-BF-124

Research & Testing

The engine was crated as is condition and sent to Continental Aerospace Technologies in Mobile, AL, for possible engine run/tear down. The carburetor was removed from the engine and put into a box and sent to Continental Motors with the engine.

According to the ADS-B data provided by the NTSB, the aircraft's total flights added to approximately 3.5 – 4 hours. According to the NTSB, the ADS-B data available was incomplete, and the time for engine start, run-up, taxi, takeoff, and initial climb for each of the three flights that day could not be accounted for. According to the applicable aircraft POH, the estimated nominal fuel consumption at cruise at 75% power would have been about 13.5 gph. Doing the math for the available total flight hours and fuel consumption, the aircraft would have used approximately 47.25 - 54 gallons of fuel. According to the applicable aircraft POH, the aircraft usable fuel was 55 gallons.

On 08-24-23, engine S/N 45748-5-J was uncrated and prepared for run testing at Continental Aerospace Technologies analytical testing facility. The impact damaged air induction system was replaced with a like system. The impact damaged oil cooler was replaced with a suitable replacement. It was noted when the original oil cooler was removed that the gasket had been installed backwards, partly blocking the oil passage. The original carburetor, magnetos, ignition harness, and spark plugs were used in the test run. During the test run the engine produced 2,450 RPM at 27.7 inches of manifold pressure (Max 2,550 RPM).



ASI-23-BF-171 – Engine in Test Stand