Cessna | Beechcraft
BY TEXTRON AVIATION

Air Safety Investigations
Aircraft Incident/Accident Technical Report

Aircraft Incident/ Accident Information	Year: 1978	Make: Cessna	Model: R182
	Serial number: R18200334	Registration: N4166C	
Location: Grand Canyon, AZ		Date: 04-19-23	Time: 1400 MST

Aircraft Owner	Aircraft Operator
Edwards Construction Group Llc [redacted]	Scott E Gross [redacted]

Report Information		
Air Safety Investigator: Kurt A. Gibson	Report #: ASI-23-BQ-T	Report date: 11-02-23

Airframe

Impact Sequence and Airframe Structure

Both wings displayed impact signatures concentrated to the outboard portions of the wings. The right wing displayed upward deformation and aft crushing damage; the left wing displayed aft crushing deformation on the outboard section of the wing. The fuselage displayed crushing damage concentrated at the forward section as well as around the main landing gear attachment areas. The empennage was undamaged.

Aircraft after Recovery (ASI-23-BQ (6).jpg)

Airframe Systems

Flight Control System Information		
Control lock: Not installed		
Flight Control Cable Continuity		
Ailerons: Established	Elevators: Established	Rudder: Established
Aileron tab: Not applicable	Elevator tab: Established	Rudder tab: Not applicable
Flap and Trim Positions		
Flap indicator: Retracted	Flap handle: ~15°	Flap actuator: Fully extended
Elevator trim:	Indicator: Unknown due to damage	Actuator: 1.4" (~5° tab up)
Rudder trim:	Indicator: Between neutral and full right	Actuator: N/A

Remarks:

All primary and secondary flight control cable continuity was established through breaks that were consistent with recovery cuts or through turnbuckles that had been disconnected by the recovery personnel.

Airframe Fuel System Condition, Controls, and Read Outs		
Fuel strainer screen: Clean	Fuel strainer bowl: Clean	
Main fuel tank gauge:	Left: Off scale low	Right: Off scale low
Fuel selector handle: Both	Fuel selector valve: Both	Fuel boost pump: On

Remarks:

Both the left and right fuel tanks were found to be intact and were devoid of fuel at the time of the examination. According to the NTSB, the initial examination of the wreckage revealed the left fuel tank was approximately ½ full and the right fuel tank was full. The NTSB reported that fuel was leaking from both wings during the initial examination. A few days after the initial examination a total of 25 gallons was drained from the right fuel tank and the left fuel tank was devoid of fuel. During this investigator's examination, low pressure air was blown into both fuel tank outlet ports and were found to be clear of obstructions. The rear pick up screens were visible and were clear of any contaminates. Low pressure air was blown into the fuel vent tube located on the left wing and the vent was found to be unobstructed. Low pressure air was blown into the vent tube as well as the crossover tube connections for both fuel tanks and were found to be unobstructed. Low pressure air was blown into the forward and rear fuel lines for both fuel tanks and the lines were found to be unobstructed, and an unmeasured amount of fuel was blown out of all four lines. A small amount of the fuel was captured in a glass and had a color and odor consistent with 100LL and no water or contaminates were noted in the sample.

The fuel selector valve was found in the BOTH position and low pressure air was blown into both sides of the fuel selector valve inlet, the selector valve was found to be unobstructed. The fuel selector valve was moved to the LEFT position followed by the RIGHT position and was found to operate normally in either position.

The fuel strainer bowl contained an unmeasured amount of fuel that had the consistency of 100LL. There were no contaminates noted within the fuel strainer bowl or the fuel strainer screen. Low pressure air was blown through the fuel strainer and the lines were found to be unobstructed.

The fuel boost pump was manually operated by attaching both wires to a spare aircraft battery. The fuel boost pump was noted to operate normally.

There were no anomalies observed with the airframe's fuel system that would have prevented normal operation.

Landing Gear System Condition and Controls			
Gear position:	Nose: Extended	Left: Extended	Right: Extended
Actuator position:	Nose: Extended	Left: Extended	Right: Extended
Landing gear selector: Extended		Emer gear handle: Not observed	

Environmental System Controls and Read Outs		
Cabin heater: Off	Cabin vent: Off	Defrost: Off
Air conditioner: N/A	Oxygen system: Not applicable	Oxygen quantity: N/A

Icing System Information and Switches			
Certified into known icing? No		De-icing boots installed? No	
Pitot heat: Off		Stall heat: Not applicable	
Anti-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable

ELT Information			
Installed? Yes	Manufacturer: Dorne & Margolin, Inc.	Model: DM ELT 6.1	Type: AF
Serial number: 4959	Battery due date: 09-23	Armed: Yes	Activated: Yes

Remarks:
None

Cabin and Equipment/Furnishings

Restraint System Information						
Seat	Occupied	Restraint type	Restraint used	Condition	Manufacturer	2nd seat stop
1	Yes	3-Point	Yes	Undamaged	Non-OEM	Yes
2	Yes	3-Point	Yes	Undamaged	Non-OEM	No
3	No	Undetermined	N/A	Not observed	Undetermined	Not applicable
4	No	Undetermined	N/A	Not observed	Undetermined	Not applicable

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

Remarks:
None

Instrument Panel

Navigation Instruments					
Analog primary instruments			Autopilot type: ARC		
Suction gage: Off scale low			Magnetic compass: Not observed		Clock: 2:40
	Left side			Left side	
Airspeed:	0 Knots		Turn coordinator (airplane):	Level	
Attitude (pitch):	30° nose down		Turn coordinator (ball):	Ball right	
Attitude (roll):	15° right		Heading indicator:	70°	
Altimeter:	1,200'		Heading "bug":	265°	
Altimeter setting:	29.96		Vertical speed indicator:	-100 fpm	

Communication and Navigation Radios							
Radio	Control	Active frequency	Stand-by frequency	Radio	Control	Active frequency	Stand-by frequency
Com 1:	Undt	Undt	Undt	Com 2:	Undt	Undt	Undt
Nav 1:	Undt	Undt	Undt	Nav 2:	Undt	Undt	Undt
Obs 1:	Undt			Obs 2:	Undt		
Transponder:	Mode: Undt		Active code: Undt			Stand-by code: Undt	

Electrical Switch Positions		
Master battery: On	Master alternator: On	Avionics 1: On

Lighting Switch Positions		
Navigation: Off	Rotating Beacon: On	Landing: Off
Taxi: Off	Strobe: Off	Instrument: Undetermined

Ignition Switch Position	
Key: Off	

Remarks:
None

Powerplant Description

Engine Instruments							
Hour meter:	3,732.2	Tach RPM:	Off scale low	Tach hours:	3,185.0	Manifold press:	28.5 inHg
Oil press:	0 psi	Oil temp:	Off scale low	EGT:	Undt	CHT:	Off scale low
Fuel press:	Off scale low	Fuel flow:	N/A	Ammeter:	0		

Engine Control Positions					
	Cockpit	Engine		Cockpit	Engine
Throttle:	Full throttle	Full throttle	Cowl flaps:	Mid travel	Not measured
Mixture:	Full rich	Full rich	Carburetor heat:	Partially open	Partially open
Propeller:	Full RPM	Full RPM	Primer:	Closed	

Engine Condition			
Engine attached to airframe:	Yes	Propeller attached to engine:	Yes
Engine compression:	Yes	Valve train continuity:	Yes
Vacuum pump drive shaft:	Undetermined		

Engine Fuel System Condition			
Fuel pump drive shaft:	Intact	Carburetor inlet screen:	See below
Fuel distribution valve screen:	Not applicable	Fuel injectors:	Not applicable

Magneto Condition	
Dual drive magneto attached:	Yes
Dual drive magneto spark:	All leads

Spark Plug Condition (per Champion Check-A-Plug Card)						
	1	2	3	4	5	6
Top	Carbon fouled	Carbon fouled	Carbon fouled	Carbon fouled	Carbon fouled	Carbon fouled
Bottom	See below	Carbon fouled	See below	Carbon fouled	See below	Carbon fouled

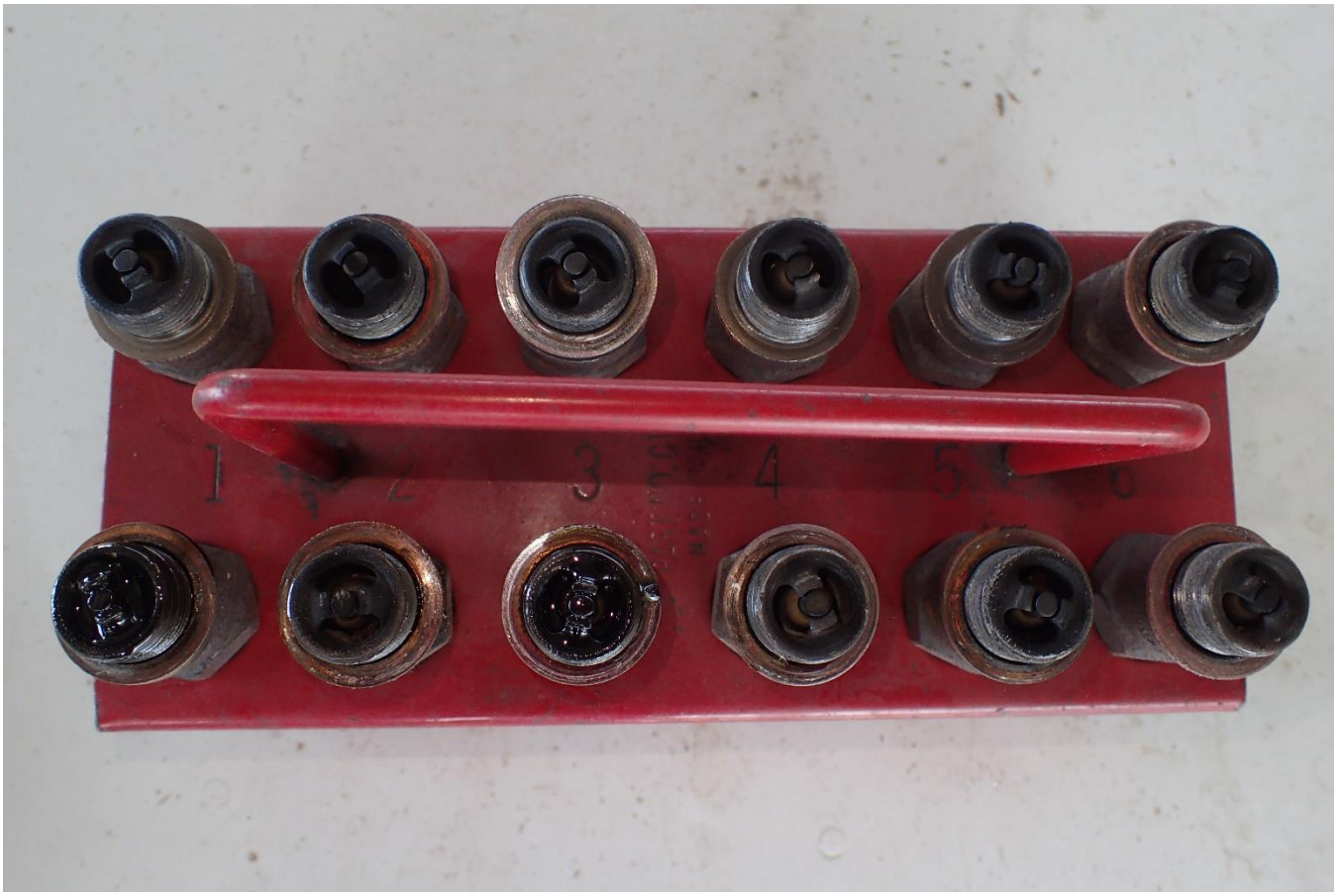
Remarks:
The engine was examined by this investigator under the supervision of the NTSB-IIC. Continuity was established between the crankshaft, camshaft, and associated components by rotating the crankshaft by hand. All six cylinders displayed good thumb compression and suction during crankshaft rotation. All of the overhead components (valves, springs, rocker arms) displayed normal operating and lubrication signatures and operated normally during crankshaft rotation.

The single drive, dual magneto remained attached to its installation point and was undamaged. During crankshaft rotation the magneto was capable of producing a spark on all ignition leads in the correct firing order. All the spark plugs were removed and visually examined. The #1, #3, and #5 bottom spark plugs were oil soaked which was consistent with post-accident accumulation. The rest of the spark plugs were heavily sooted which is consistent with an overly rich mixture during engine operation.

The induction system was inspected and there were no signs of induction leaks or obstructions. The exhaust flame cones were examined and were found to remain intact and there were no signs of obstructions in the exhaust system.

The engine driven fuel pump was removed and the drive lever remained intact. The fuel pump inlet line was placed into a bucket full of 100LL fuel and the fuel pump drive lever was actuated by hand, the fuel pump was capable of pumping fuel and there were no signs of leaks around the fuel pump. The carburetor was noted to be undamaged, and all of the fuel lines were secure. The carburetor was retained by the NTSB for testing and examination by an overhaul facility. As of this report's writing, the examination had not taken place.

Engine Overview (ASI-23-BQ (71).jpg)



Spark Plugs (ASI-23-BQ (107).jpg)

Propeller

The three blade, constant speed propeller remained attached to the engine and displayed impact damage signatures. Propeller blade #1 displayed minor forward bending deformation, and several gouges in the leading edge near the blade tip and a portion of the blade tip had fracture separated from the rest of the blade. Propeller blade #2 exhibited significant forward bending deformation and had several large gouges at the propeller blade tip. Propeller blade #3 displayed forward bending deformation and leading edge gouges at the blade tip. All three propeller blades displayed chordwise scratches on the aft side of the propeller blades.

Propeller Overview (ASI-23-BQ (121).jpg)

Research & Testing

None.