

NTSB Accident Summary

Accident Number CEN19FA236



ACCIDENT

Location: Chadron, Nebraska
Date: July 24, 2019
Time: 1420 MDT
Aircraft: Beech 95-B55 (T42A) - s/n TC-946
Registration: N8910U

HISTORY OF FLIGHT

On July 24, 2019, about 1420 mountain daylight time, a Beech 95-B55(T42A) airplane, N8910U, impacted trees and terrain about ½ mile north of Charon Municipal Airport (CDR), Chadron, Nebraska. The pilot and two passengers were fatally injured and the airplane sustained substantial damage. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Visual meteorological conditions prevailed at the time of the accident and an instrument flight rules flight plan had been filed. The flight departed Fond Du Lac County Airport (FLD), Fond du Lac, Wisconsin, about 1120 central daylight time, and was en route to CDR.

No ADS-B equipment indicated. Prelim track data indicates that N8910U likely departed OshKosh (OSH) or Fond du Lac (FLD) between 1005-1015 MDT. The first track data picked up at 1022 MDT about 1.25 nm northwest of KFLD, climbing out of 1475' msl westbound and on a beacon code of 7227. The flight track was unremarkable for the next few hours as the aircraft reached a cruising altitude of about 8,000'. At 1348 MDT track data was lost near Spring Creek, SD at which time altitude indicated 8225' msl and ground speed was 154 kts. At about 1408 MDT track data picked back up for less than 3 minutes during which time altitude initially indicated 8125' then beginning to descend and at the time track data was lost again at 1410 the altitude indicated 7300' and ground speed was 174 kts. At about 1417 track data once again picked up but this time on a 1200 beacon code. Altitude indicated 6050' and ground speed was 150 kts, the track again was lost and the last track data received was at 1417:28 at an altitude of 6050' and ground speed of 158 kts about 12 miles from CDR.

First Track Data 1122:03 CDT (1022:03 MDT) / 1475' / 112 kts / About 1.25 nm NW of KFLD
Last Track Data: 1417:28 MDT / 6050' / 158 kts / 42.884639N / -102.827201W

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PERSONNEL INFORMATION

Pilot:

Damon Frank Brown – [REDACTED], Sebastopol, CA

Airmen certificate: [REDACTED] Commercial C/ASEL C/AMEL C/INSTA

Medical certificate: 3rd class issued 10/10/17 - Must have available glasses for near vision. BasicMed Course and Comprehensive Medical Examination Checklist (CMEC) Date: 7/11/2019

Flight hours: 2,200 total and 60 hours in last six months as of medical exam dated 10/10/2017

Pilot rated passenger:

Duncan Fletcher Brown – [REDACTED] Sebastopol, CA

Airmen certificate: [REDACTED] Private ASEL

Medical certificate: 3rd class issued 7/21/2015

Flight hours: 85 total and 0 hours in last six months as of exam dated 07/21/2015

Passenger:

Sarah Andrews Brown – [REDACTED], Sebastopol, CA

AIRCRAFT INFORMATION

Beech 95-B55 (T42A) - s/n TC-946

Left Engine - CS192677-72-L-R

Right Engine - CS192877-R

AIRPORT INFORMATION

Chadron Municipal Airport (CDR) Chadron, Nebraska, USA

Lat/Long: 42-50-15.2077N / 103-05-43.4469W

42.8375577 / -103.0954019

Elevation: 3297.8 ft

Variation: 07E (2020)

From city: 4 miles W of CHADRON, NE

Time zone: UTC -6 (UTC -7 during Standard Time)

Zip code: 69337

METEOROLOGICAL INFORMATION

METARs

2019.07.24.**2053** METAR KCDR 242053Z AUTO 19013G20KT 10SM CLR 37/14 A2995 RMK AO2 SLP108

Accident time: **2020**

2019.07.24.**1953** METAR KCDR 241953Z AUTO 17014KT 10SM CLR 35/16 A2997 RMK AO2 SLP114

TAFs

201907242115 KCDR 242115Z 2421/2518 17013G24KT P6SM SKC FM242300 18013KT P6SM VCTS SCT080CB

BKN250 FM250400 VRB05KT P6SM SCT150=

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201907241720 TAF KCDR 241720Z 2418/2518 17008KT P6SM SKC FM242300 18013KT P6SM VCTS SCT080CB BKN250 FM250400 VRB05KT P6SM SCT150=

201907241134 TAF KCDR 241134Z 2412/2512 16011KT P6SM FEW200 FM241800 18012G22KT P6SM SCT150 FM242200 18015G25KT P6SM VCTS SCT080CB BKN150 FM250800 18007KT P6SM SCT180=

DEVICES WITH NON-VOLATILE MEMORY

1. Shadin Digiflo-L - Digital Fuel Management System (See Shadin Factual Report)
2. Garmin handheld GPSMAP 396 (see GPS Factual Report)
3. GoPro (no recording from the accident)

WRECKAGE AND IMPACT INFORMATION

The accident site was located at 42.850178° x -103.084908° - elevation 3,240 ft msl. The site was 0.25 nm north-northeast of the end of runway 21 at CDR and 0.33 nm from the beginning of the displaced threshold.



The airplane descended into a tree line in a left-wing-low, nose-down flight attitude and then impacted a grass covered field approximately 0.25nm northeast of Runway 20 at KCDR. The right horizontal stabilizer separated from the aircraft and was found approximately 10' AGL in the impacted tree. The right elevator, with elevator trim tab attached, came to rest at the base of the impacted tree. The left wing struck the ground first and the left wing tip, approximately 3'-long, separated from the wing. The outboard section of the left wing, containing the left aileron, sustained tree impact damage and was also separated from the aircraft. The inboard section the left wing, with the flap attached, remained attached to the fuselage. The right wing remained in one piece and was attached to the fuselage. The right flap was hanging downward and remained attached at the outboard flap track.

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The vertical stabilizer and the rudder remained attached to the tail. The left horizontal stabilizer, with the left elevator attached, remained connected to the tail. The top of the cabin was removed by first responders and the aft cabin roof was bent aft to facilitate recovery efforts.

Partial flight control cable continuity was established due to lower forward fuselage compression damage.

The left fuel selector handle was impact separated. The left fuel selector handle fractured roll pin hole was aligned with the left handle being selected to the main fuel tank. The left fuel selector yoke was turned using a wrench and the left main tank position was confirmed. The right fuel selector handle was removed, and the right fuel selector yoke was turned with a wrench. The right fuel selector valve was found to be positioned on the right main fuel tank. Approximately 3 ounces of fuel was drained from the right fuel strainer assembly. The left fuel strainer assembly was not examined.

The nose and main gear were impact separated from the fuselage.

The seats remained loosely attached to their respective seat rails. Seat 4, 5, and 6 had been removed from the aircraft. The aircraft was packed with camping gear which included, tents, sleeping bags, air mattresses, chairs, a cooler and food stuffs. All items were removed from the cabin and nose baggage compartment. The items were weighed using a bathroom scale. The cargo in the cabin weighed 293.6 pounds. The cargo in the nose baggage area weighed 116 pounds.

The lower left instrument panel plastic switch identification plate was fractured and separated from the instrument panel.

Partial valve train continuity on the left engine due to the oil sump being crushed against the camshaft.

The left propeller remained attached to the engine. One blade remained straight and exhibited light chordwise scratches and paint burnishing on the cambered side. The other blade was bent aft around the cowling in the shank area. The blade remained straight, no twisting or curling, outboard of the bend at the shank and it also had minor paint burnishing.

The right propeller was separated from the right engine and came to rest under the fuselage embedded in the soft soil. One blade was straight and exhibited no rotational impact signatures. The other blade was bent aft around the cowling in the shank area. It also remained straight outboard of the bend and did not exhibit rotational impact signatures.

Left Engine Examination Summary

CS192677-72-L-R

At the accident site on July 25th, the engine remained attached to the airframe and exhibited impact damage. The fuel line from the metering unit to the fuel flow transducer was intact and removed on site at the fuel flow transducer where a few drops of fuel were observed. The engine driven fuel supply line from the fire wall was disconnected at the engine driven fuel pump and between one and two ounces of fuel was drained.

The left engine exhibited impact damage to the oil sump, induction system and exhaust system.

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The top spark plugs were removed and the electrodes exhibited light grey combustion deposits and the electrodes were worn out-normal to worn out-severe when compared to the Champion Check a Plug chart.

The fuel manifold valve was partially disassembled and the fuel screen was free of obstruction. The diaphragm was intact and the retaining nut secure. A small amount of fuel was observed in the manifold valves' cavity.

The throttle body/fuel metering unit screen was removed and free of obstruction. Both the mixture arm and throttle arm moved freely by hand from stop to stop.

The cylinder combustion chambers were inspected with a lighted bore scope with no anomalies noted. The bottom spark plugs exhibited signatures consistent with the top spark plugs.

The right magneto was impact separated from its mount but remained attached to the engine by the ignition harness. The left magneto remained attached to the engine and was removed. Both magneto drives were turned using an electric drill and the magnetos produced spark on all ignition leads.

An attempt to rotate the crankshaft using the propeller was limited due to impact damage to the oil sump being crushed upward into the camshaft gears. The crankshaft was rotated about 45 degrees using the propeller and the starter adaptor pulley was observed to turn, as well as movement of the number 6-cylinder exhaust valve and rocker arm.

The valve covers were removed and the cylinder overhead areas did not display any anomalies and a coating of oil was observed.

Right Engine Examination Summary CS192877-R

On site, the engine was located under the right wing and the right propeller and crankshaft propeller flange were separated from the crankshaft and located in the ground directly in front of and below the right engine. The engine remained attached to the airframe by control cables, fuel lines and wiring.

The engine was recovered along with the rest of the aircraft to the Chadron, NE airport where it was examined on July 26, 2019.

The right engine exhibited impact damage to the oil sump, induction and exhaust systems and some cylinder fins.

The top spark plugs were removed and the electrodes exhibited light grey and dark combustion deposits and the electrodes were worn out-normal to worn out-severe when compared to the Champion Check a Plug chart.

The fuel manifold valve was partially disassembled and the fuel screen was free of obstruction. The diaphragm was intact and the retaining nut secure. A small amount of fuel was observed in the manifold valves' cavity.

The throttle body/fuel metering unit screen was removed and free of obstruction. A very small amount of fuel was observed coming from the metering unit. Both the mixture arm and throttle arm moved freely by hand from stop to stop.

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Several of the right engines fuel line fittings were impact fractured which compromised the fuel system.

The cylinder combustion chambers were inspected with a lighted bore scope with no anomalies noted. The bottom spark plugs exhibited signatures consistent with the top spark plugs.

The right magneto was impact separated from its mount but remained attached to the engine by the ignition harness. The left magneto remained attached to the engine and was removed. Both magneto drives were turned using an electric drill and the magnetos produced spark on all ignition leads.

The crankshaft was rotated by hand using a tool on in an accessory gear drive. Continuity from the rear of the engine to the front of the engine and throughout the valve train was confirmed.

The valve covers were removed and the cylinder overhead areas did not display any anomalies and a coating of oil was observed.

MEDICAL AND PATHOLOGICAL INFORMATION

See final report and docket items

FUEL CALCULATION

N8910U Fuel consumption calculation				
	Time (hrs)	Fuel (gals)	GPH	Distance (nm)
Start/Runup/Taxi/Takeoff	0.25	5		
Climb to 8,000 ft	0.1	4		15
Cruise	3.75	105	28	600
Descent	0.17	3		30
Total		117		

ADDITIONAL FUEL SYSTEM EXAMINATION (2/25/2020)

NTSB IIC and Textron representative convened at the recovery facility to further examine the fuel system, fuel quantity transmitters, and fuel bladder snaps.

Several of the bladder snaps were un-snapped from all of the fuel bladders – these were likely unsnapped during the accident sequence and ground impact.

The fuel quantity transmitter safety wires were not all consistent. Some had the wrong wire and some had phillips head screws that were incorrect for securing safety wire.

The fuel quantity transmitters were measured for proper resistance during range of travel. They did not all meet the design specifications. They were all old parts and had not been serviced in a long time and were likely the original parts. Fuel quantity transmitter (liquidometer) resistances below:

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Left Aux Outboard	Impact damage to the resistance housing/wiper. Impact damage to the float
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Left Aux Inboard	Arm Down	Arm Up	All travel
Terminal 1 to cap	136 ohms (Limit 107-113)	22 ohms (Limit 0-3)	
Terminal 2 to cap			138 ohms
Terminal 3 to cap			Open circuit
Terminal 1 to 2	18 ohms	113 ohms	
Terminal 1 to 3			Open circuit

<(Limit 107-113
any position)

Left Main Outboard	Arm Down	Arm Up	All travel
Terminal 4 to cap	46 ohms (Limit 38-42)	3 ohms (Limit 0-2)	

Left Main Outboard	Arm Down	Arm Up	All travel
Terminal 1 to cap	-- (Limit 116-123)	-- (Limit 0-4)	Variable
Terminal 2 to cap	180 ohms	195 ohms	Intermittent

<(Limit 114-123
any position)

Right Aux Outboard	Arm Down	Arm Up	All travel
Terminal 3 to cap	-- (Limit 48-52)	-- (Limit 0-2)	Open circuit
Terminal 4 to cap			52 ohms

<(Limit 48-52
any position)

Right Aux Inboard	Arm Down	Arm Up	All travel
Terminal 1 to cap	140 ohms (Limit 107-113)	3 ohms (Limit 0-3)	
Terminal 2 to cap			138-140 ohms
Terminal 3 to cap			Open circuit
Terminal 1 to 2	4 ohms	118 ohms	
Terminal 1 to 3			Open circuit

<(Limit 107-113
any position)

Right Main Outboard	Arm Down	Arm Up	½ travel to full up
Terminal 4 to cap	40 ohms (Limit 38-42)	(Limit 0-2)	Open circuit

Right Main Outboard	Arm Down	Arm Up	All travel
Terminal 1 to cap	177 ohms (Limit 116-123)	47 ohms (Limit 0-4)	
Terminal 2 to cap			171 ohms

<(Limit 114-123
any position)