

## CEN21LA151 (N3394V, Beech 35) – NTSB Examination Report

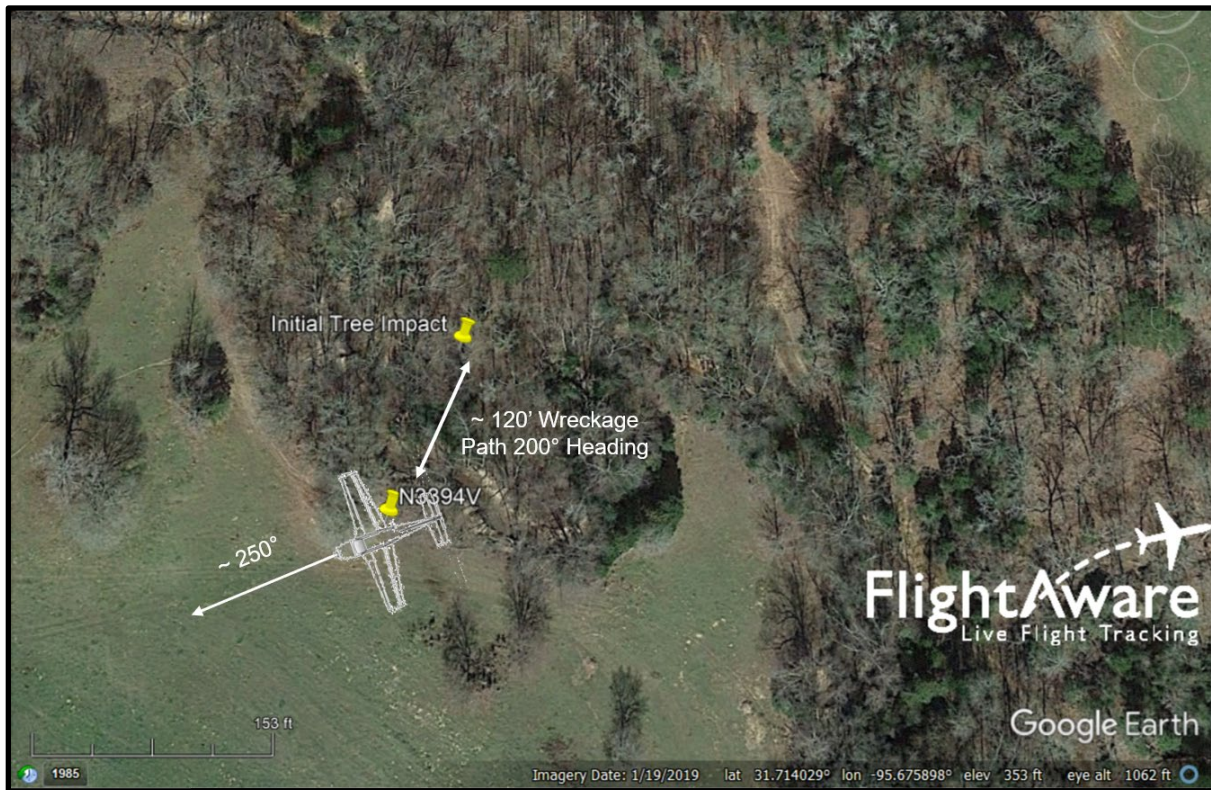


Figure 1 – Image of the accident site (courtesy of Textron Aviation).

- The airplane impacted private property in Palestine, Texas. The area is private property that has trees and pasture.
- The FAA North Texas FSDO (Lou Vargo – aviation safety inspector) and Textron Aviation (Casey Love – air safety investigator) responded to the accident site on March 7, 2021. The wreckage was documented and examined. The wreckage was recovered by Lone Star Retrieval.
- On March 12, 2021, the airframe and engine were examined at Air Salvage of Dallas in Lancaster, Texas. Present was Craig Hatch (NTSB aerospace engineer) and Casey Love.
- The right wing of the airplane impacted trees from midspan to the tip. Fragments of the wing skin and wing tip were found along the debris path. All four corners were observed at the accident site. The left side of the fuselage contacted the wing, reducing the cabin volume. The empennage was intact. There was no post impact fire. The forward engine mounts were fracture separated from the engine.

## 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: Established
Flap and Trim Positions		
Flaps:	Indicator: N/A	Handle: Off
	Left actuator: Up	Right actuator: Up
Elevator trim:	Indicator: Undetermined	
	Left actuator: Neutral	Right actuator: Neutral
Rudder trim:	Indicator: Not applicable	Actuator: NA

- The elevator trim wheel was found broken into multiple pieces during the impact sequence.

Airframe Fuel System Condition, Controls, and Read Outs		
Fuel strainer screen: Clean	Fuel strainer bowl: Clean	
Main fuel tank gauge:	Left: Empty	Right: Empty
Fuel selector handle: See below	Fuel selector valve: See below	Fuel boost pump: See below

- The fuel selector was observed on-scene with the handle in an intermittent position between OFF and LEFT and pulled up in the pump position approximately  $\frac{1}{4}$ ". Air could not be passed through any of the fuel selector ports in its observed position.
- The placard depicting the position selection and operation for the fuel selector was not observed.
- During the wreckage examination, the valve functioned properly when air was passed through each port as the handle was rotated through each position. Detents were not noted as the handle was rotated through the tank positions.
- Neither wing fuel tank contained observable fuel levels on scene. There was no evidence of fuel spillage, smell, or vegetation blighting at the accident site.
- During the follow-up wreckage examination, the inside of the fuel bladders was inspected using a borescope. The right bladder contained fine and coarse sand and what appeared to be the exoskeletons of small insects. The estimated volume of sediment was one tablespoon. The same type of debris was observed in the fuel selector screen housing. The left bladder was clean. Both bladders exhibited signs of deterioration around the fuel outlets and fuel drain valves. Both bladder finger screens were clean.
- After the visual examination, both bladders were leak checked using water. The right-wing bladder was not breached. The fuel drain valve leaked at a rate of one drop approximately every 5 seconds. The left-wing bladder was punctured by a fracture in the inboard wing rib. The puncture was roughly in the lower one third between the upper and lower surface of the bladder and 2" to 3" from the aft wall of the bladder. The puncture measured approximately  $\frac{1}{2}$ " in length and produced a steady and noticeable stream of water during the leak test. It was undetermined if other leaks existed in the bladder.
- The fuel lines appeared to be intact through the cabin to the firewall.
- No evidence of external fuel leaks was observed on the skin of the airplane.
- The rubber fuel caps were dry and brittle. The seat of the filler openings was corroded.

- The left fuel vent was obstructed at the tube bend of the outboard vent tube at the anti-siphon wye. The inboard portion of the tubing contained fuel.
- The right-wing fuel vent was separated where the hose connected the tube portions at the outboard access panel. The anti-siphon tube was also disconnected at the hose joint connection.
- An auxiliary fuel tank was installed in the baggage compartment, which also contained zero fuel.
- The fuel selector was removed for examination. It contained approximately 1.5 oz of sediment contaminated fuel that tested negative for water.

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: Stowed
Environmental System Controls and Read Outs			
Cabin heater:	Off	Cabin vent: Off	Defrost: Undt
Air conditioner:	NA	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:	Off		Stall heat: Not applicable
Anti-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable
ELT Information			
Installed?	Yes	Manufacturer: Narco	Model: ELT10
Type:	Undt		
Serial number:	29961	Battery due date: 2012	Armed: Undetermined
Activated:	No		

- The landing gear circuit breaker was observed in the tripped position.
- The right landing gear was displaced upward through the wing.
- The nose gear was folded to the right.
- The left landing gear was folded toward the up position and rested on the outside of the closed gear door.

#### Cabin and Equipment/Furnishings

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

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

## Instrument Panel

Navigation Instruments							
Analog primary instruments				Autopilot type: None			
Suction gage: 0		Magnetic compass: Undt			Clock: Undt		
	Left side				Left side		
Airspeed:	0			Turn coordinator (airplane):	NA		
Attitude (pitch):	5° nose dwn			Turn coordinator (ball):	Centered		
Attitude (roll):	7° left wing low			Heading indicator:	200		
Altimeter:	9,650'			Heading "bug":	NA		
Altimeter setting:	30.16			Vertical speed indicator:	-200		
Stand-by:	Airspeed: NA		Attitude (pitch): NA		Attitude (roll): NA		
	Altimeter: NA		Altimeter Setting: NA				
Communication and Navigation Radios							
Radio	Control	Active frequency	Stand-by frequency	Radio	Control	Active frequency	Stand-by frequency
Com 1:	Off	135.575	NA	Com 2:	Off	122.900	NA
Nav 1:	ADF	611	NA	Nav 2:	NA	NA	NA
Obs 1:				Obs 2:			
Transponder:	Mode: Off		Active code: 1200		Stand-by code: NA		
Electrical Switch Positions							
Master battery: On		Generator: Off			Avionics 1: Not applicable		
Lighting Switch Positions							
Navigation: Off		Rotating Beacon: Off			Landing: Off		
Taxi: Off		Strobe: Not applicable			Instrument: Off		
Ignition Switch Position							
Key: Off							

## Powerplant Description

Engine Instruments							
Hour meter:	NA	Tach RPM:	0	Tach hours:	412.91	Manifold press:	30
Oil press:	0	Oil temp:	320	EGT:	NA	CHT:	0
Fuel press:	0	Fuel flow:	NA	Ammeter:	0	Voltmeter:	NA
Engine Control Positions							
	Cockpit	Engine		Cockpit	Engine		
Throttle:	.25" from full	Undt		Cowl flaps:	NA	NA	
Mixture:	Full rich	Undt		Carburetor heat:	Off	Undt	
Propeller:	Undt	Undt		Primer:	Undt		
Engine Condition							
Engine attached to airframe: Partially			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: Clean				
Fuel distribution valve screen: Not applicable			Fuel injectors: Not applicable				
Magneto Condition							
Left magneto attached: Yes			Right magneto attached: Yes				
Left magneto spark: All leads			Right magneto spark: All leads				
Spark Plug Condition (per Champion Check-A-Plug Card)							
	1	2	3	4	5	6	
Top	Normal	Normal	Normal	Normal	Normal	Normal	
Bottom	Not examined	Not examined	Not examined	Not examined	Not examined	Not examined	

- The carburetor was impact separated and fragmented.
- The engine crank assembly and valve train continuity was verified by observing movement while rotating the crankshaft.
- Each cylinder built compression on the appropriate stroke.
- The fuel pump rotated freely.
- The fuel supply lines were verified to be free from debris by passing air through the system or by passing a flexible plastic cable through the lines.
- The magnetos produced spark on all leads.
- The exhaust system was free from obstructions.
- The propeller was unremarkable. The leading edges were smooth and undamaged.

**NATIONAL TRANSPORTATIONS SAFETY BOARD**  
**Office of Aviation Safety**  
**Washington, DC 20594**

**SUMMARY OF AIRPLANE EXAMINATION**

-- CEN21LA151 --

**A. ACCIDENT**

Aircraft: Beechcraft 35, N3394V

**B. PARTICIPANTS**

Craig Hatch  
Aerospace Engineer  
National Transportation Safety Board  
Denver, Colorado

Casey Love  
Air Safety Investigator  
Textron Aviation, Inc  
Wichita, Kansas

**C. ACCIDENT SUMMARY**

See factual report

**D. DETAILS OF ENGINE EXAMINATION**

A post-recovery engine examination was conducted at Air Salvage of Dallas, Lancaster, Texas, on March 12, 2021.

**E. SUMMARY OF ENGINE EXAMINATION**

**Airframe** – Beech 35

**Engine** – Teledyne Continental Motors E-185

**Propeller** – 2 Bladed,

- The front engine mounts were broken and there was heavy damage to the airplane. An engine test run was not able to be performed.
- The fuselage (with engine) was placed on stands; the wings which had been moved for transport, was aside the fuselage.
- The 2-bladed propeller remained attached to the engine crankshaft flange, the blades were absent indications of engine power.
- An initial inspection of the engine did not reveal a reason for a loss of engine power
- The engine driven fuel pump was removed; the pump turned freely, and the drive shaft was intact.
- The top set of sparkplugs were removed; normal wear and combustion deposits on the electrodes were noted.



## Summary of Engine Examination

- The P-leads were disconnected from each of the Bendix magnetos. The magnetos were turned, and spark was observed on the top set of ignition leads. The magnetos were removed from the engine and rotated; spark was observed on each terminal lead.
- Thumb compress and section, on each cylinder, was noted when the engine was rotated, using the propeller. Continuity thru the valve train and accessory drive was confirmed.
- Each cylinder was examined using a borescope; no abnormalities were noted with either the intake or exhaust valves.
- Oil screen was removed; the screen contained unidentified contaminates.
- The carburetor had broken free from the bottom of the engine during the accident sequence.
  - The controls remained attached to the carburetor. The inlet fuel screen for the carburetor was clear of debris.
- The airplane had two wing fuel tanks and a 20-gal aux tank, located behind the rear seat.
- The fuel pickup point was capped off on the left wing, and water from a garden hose, was used to fill the wing fuel tank. After a few minutes, water appeared to be leaking from the tank. An aluminum piece of sheet metal, at the wing root appeared to have punctured the fuel bladder. The procedure was repeated on the right wing; this time no water appeared to leak.
- Various control cables were identified for control continuity.
- No preimpact anomalies were noted during the airplane examination.



Airplane wreckage on stands, ready for inspection

## Summary of Engine Examination



Heavy damage was noted to both wings



2-bladed propeller appeared to be absent power signatures



## Summary of Engine Examination



Oil screen contained unidentified contaminants



Fuel pump drive coupling, intact, pump rotated freely

## Summary of Engine Examination



Mixture of old and new sparkplugs



Landing gear circuit breaker was “popped”. Gear indicator in the down position  
And landing gear motor, indicate the landing gear was in the down position.



## Summary of Engine Examination



Fuel screen from the carburetor; clear of contaminants.



Testing fuel tank for leaks

## Summary of Engine Examination



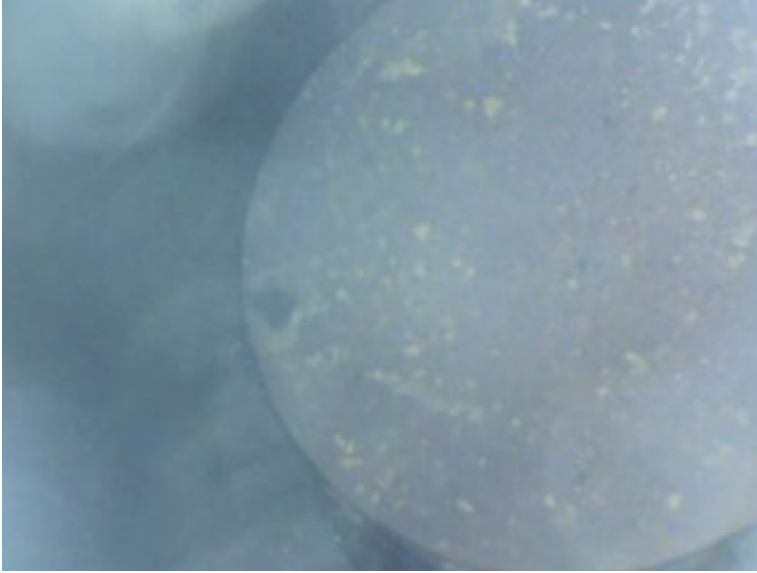
Left sided did leak, there appeared be a post-cash puncture at the wing root



Water test was repeated for the right wing



## Summary of Engine Examination



A borescope was used to inspect the engine's intake and exhaust valves

----- *end of summary* -----