

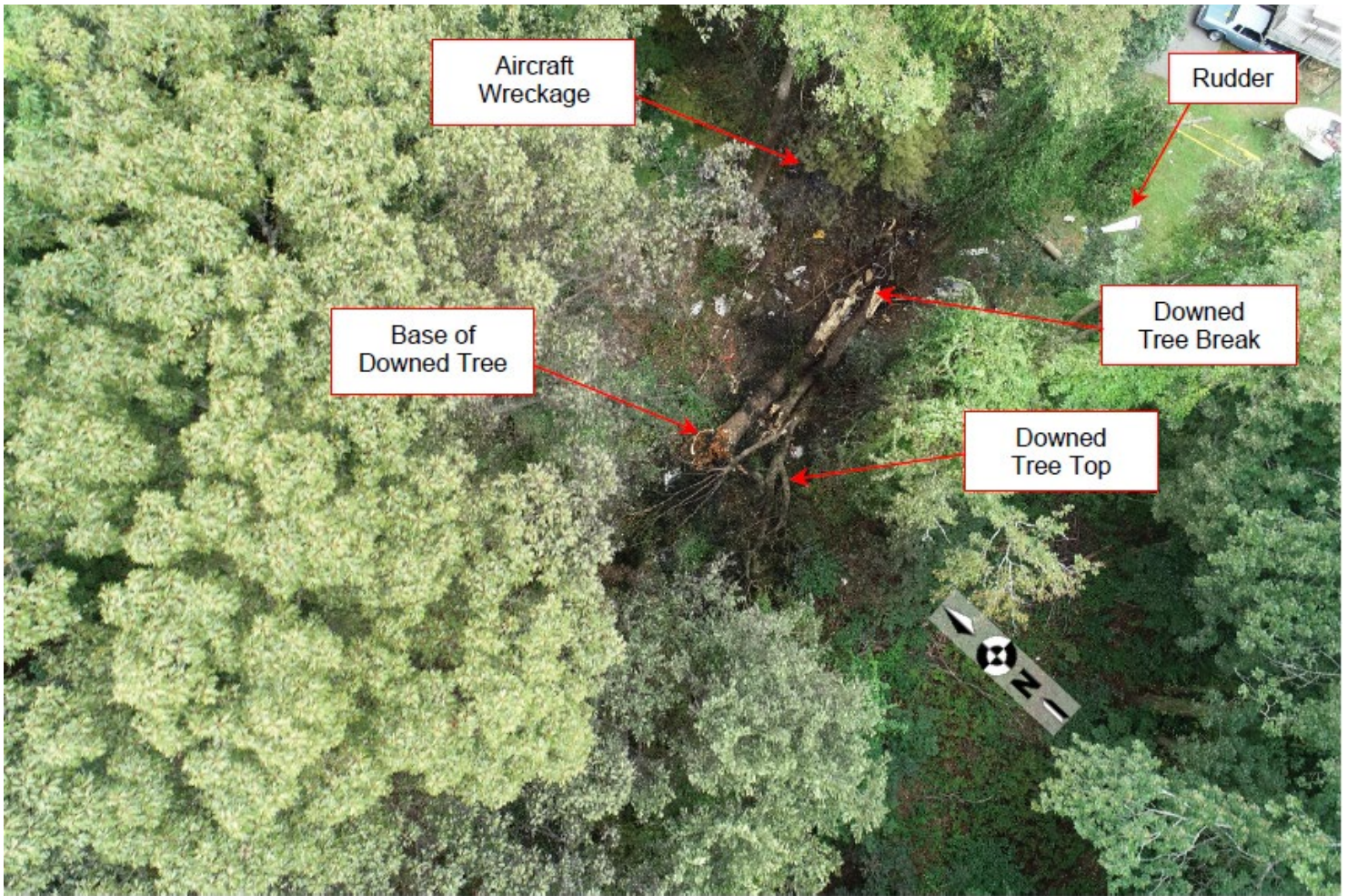
Air Safety Investigations Aircraft Incident/Accident Technical Report

Aircraft Incident/ Accident Information	Year: 2006	Make: Cessna	Model: LC41-550FG
	Serial number: 41594		Registration: N2536T
Location: Woburn, MA		Date: 09-15-18	Time: 1102 EDT
Aircraft Owner		Aircraft Operator	
L Michael Graver [REDACTED] Manhasset, NY 11030-3931		Same as aircraft owner	
Report Information			
Air Safety Investigator: Jennifer D. Barclay		Report #: ASI-18-CU-T	Report date: 01-11-19

Airframe

Impact Sequence and Airframe Structure

The aircraft impacted trees and traveled through a wooded area for about 100 yards before coming to rest at the base of a hill. Both wingtips and both horizontal stabilizer tips were located approximately halfway through the wreckage path. Portions of all flight controls were located along the path. The empennage and main landing gear were located the greatest distance from the initial impact point.



NTSB drone photo of site



On-site ASI-18-CU-003

Airframe Systems

Flight Control System Information		
Control lock: Undetermined		
Flight Control Cable Continuity		
Ailerons: See below	Elevators: See below	Rudder: See below
Aileron tab: Undetermined	Elevator tab: See below	Rudder tab: Not applicable
Flap and Trim Positions		
Flap indicator: Undetermined	Flap handle: 0	Flap actuator: Undetermined
Elevator trim: Indicator: Undetermined	Actuator: 3.3"	
Rudder trim: Indicator: Not applicable	Actuator: Not applicable	
Aileron trim: Indicator: Undetermined	Actuator: 4.3"	

Remarks:

The aileron and elevator control tubes were found connected to the left and right side control sticks. The aileron control rod was intact from the side stick to the aileron torque tube bellcrank. The elevator push/pull tube was attached to the elevator interconnect assembly. The wing aileron control tubes and the fuselage elevator control tubes separated from their mounts and were found along the wreckage path.

The rudder cables were attached to the rudder torque tubes. The cables had separated in tension overload at approximately the middle of the fuselage. The rudder separated from the empennage.

The elevator trim tab cable exhibited failure under tensile load.



Left side stick control tubes, On-site ASI-18-CU-057

Airframe Fuel System Condition, Controls, and Read Outs		
Fuel strainer screen: See below	Fuel strainer bowl: See below	
Main fuel tank gauge:	Left: 0	Right: 0
Fuel selector handle: Undetermined	Fuel selector valve: Right	Fuel boost pump: Undetermined

Remarks:

The fuel strainer was not disassembled due to swelling from post-impact fire.

Landing Gear System Condition and Controls			
Gear position:	Nose: Fixed	Left: Fixed	Right: Fixed
Actuator position:	Nose: Not applicable	Left: Not applicable	Right: Not applicable
Landing gear selector: Not applicable			
Environmental System Controls and Read Outs			
Cabin heater: Undt	Cabin vent: Undt	Defrost: Undt	
Air conditioner: Undt	Oxygen system: Undetermined	Oxygen quantity: Undt	
Icing System Information and Switches			
Certified into known icing? Undetermined		De-icing boots installed? Undetermined	
Pitot heat: Undetermined		Stall heat: Undetermined	
De-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable
Anti-ice:	Surface: Undetermined	Propeller: Not applicable	Windshield: Undetermined
ELT Information			
Installed? Yes	Manufacturer: Artex	Model: ME406	Type: AF/AP
Serial number: 197-03475	Battery due date: 12-2023	Armed: Yes	Activated: Yes

Remarks:

Two wheels and two wheel pants were found near the middle of the wreckage path.

Cabin and Equipment/Furnishings

Restraint System Information						
Seat	Occupied	Restraint type	Restraint used	Condition	Manufacturer	2nd seat stop
1	Yes	3-Point	Undt	See below	Undetermined	Undetermined
2	Yes	3-Point	Undt	See below	Undetermined	Undetermined
3	No	Undetermined	Undt	See below	Undetermined	Undetermined
4	No	Undetermined	Undt	See below	Undetermined	Undetermined

Seat Condition Information					
Seat	Orientation	Feet intact	Back intact	Base intact	Rail intact
1	Forward facing	No	No	No	No
2	Forward facing	No	No	No	No
3	Forward facing	No	No	No	No
4	Forward facing	No	No	No	No

Remarks:

The cabin seats detached from their mounting points during impact. The seat bases were fractured into multiple pieces and dispersed from the final impact point in several directions.

Instrument Panel

Navigation Instruments							
Digital primary instruments				Autopilot type: Undetermined			
Suction gage: Undt		Magnetic compass: Undt			Clock: Undt		
	PFD 1	PFD 2		PFD 1	PFD 2		
Airspeed:	Undt	Undt	Turn coordinator (airplane):	Undt	Undt		
Attitude (pitch):	Undt	Undt	Turn coordinator (ball):	Undt	Undt		
Attitude (roll):	Undt	Undt	Heading indicator:	Undt	Undt		
Altimeter:	Undt	Undt	Heading "bug":	Undt	Undt		
Altimeter setting:	Undt	Undt	Vertical speed indicator:	Undt	Undt		
Stand-by:	Airspeed: Undt		Attitude (pitch): Undt		Attitude (roll): Undt		
	Altimeter: Undt		Altimeter Setting: Undt				
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		Master alternator: Undetermined		Avionics 1: Undetermined			
Stand-by battery: Undetermined		Alternator 2: Undetermined		Avionics 2: Undetermined			
Lighting Switch Positions							
Navigation: Undetermined		Rotating Beacon: Undetermined		Landing: Undetermined			
Taxi: Undetermined		Strobe: Undetermined		Instrument: Undetermined			
Wing Ice: Undetermined							
Ignition Switch Position							
Key: Undetermined							

Remarks:

A memory card presumed to be from the G1000 was retained by the NTSB to be analyzed.

Powerplant Description

Engine Instruments						
Hour meter:	Undt	Tach RPM:	Undt	Tach hours:	Undt	
Oil press:	Undt	Oil temp:	Undt	EGT:	Undt	
Fuel press:	Undt	Fuel flow:	Undt	Ammeter:	Undt	
Manifold press: Undt						
CHT: Undt						
Voltmeter: Undt						
Engine Control Positions						
	Cockpit	Engine		Cockpit	Engine	
Throttle:	Undetermined	Undetermined	Cowl flaps:	Undetermined	Undetermined	
Mixture:	Undetermined	Undetermined	Carburetor heat:	Undetermined	Undetermined	
Propeller:	Undetermined	Undetermined	Primer:	Undetermined		
Engine Condition						
Engine attached to airframe: No			Propeller attached to engine: No			
Engine compression: See below			Valve train continuity: See below			
Vacuum pump drive shaft: Undetermined						
Engine Fuel System Condition						
Fuel pump drive shaft: Intact			Carburetor inlet screen: Not applicable			
Fuel distribution valve screen: Clean			Fuel injectors: Clean			
Magneto Condition						
Left magneto attached: See below			Right magneto attached: Yes			
Left magneto spark: Undetermined			Right magneto spark: No			
Spark Plug Condition (per Champion Check-A-Plug Card)						
	1	2	3	4	5	6
Top	Normal	Not examined	Normal	Normal	Normal	Normal
Bottom	Normal	Normal	Normal	Normal	Normal	Normal

Remarks:

The engine sustained severe impact damage to the left side which prevented full rotation of the crankshaft. Crankshaft continuity was confirmed. Partial compression and valve train continuity were established. The left magneto was loose from its mounting pad but remained attached to the engine by the ignition leads.



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Propeller

The propeller was detached from the engine during impact. The blades were bent aft and exhibited chordwise scratching indicative of rotation under power as the aircraft traveled through the trees. Multiple branches, three to four inches in diameter, exhibited cuts that were consistent with propeller contact.



NTSB photo



On-site ASI-18-CU-071

Research & Testing

At the time this report was written, the examination of the SD card presumed to be from the G1000 had not been completed.

Video from a doorbell camera was analyzed by the propeller manufacturer. A 127.5 Hz frequency was identified that belonged to the propeller. It was determined that the three-bladed propeller was rotating around 2,550 RPM during the recording.