

Air Safety Investigations Aircraft Incident/Accident Technical Report

Aircraft Incident/ Accident Information	Year: 1973	Make: Cessna	Model: T310Q
	Serial number: 310Q0611		Registration: N301JA
Location: Wichita, KS		Date: 09-25-15	Time: ~1550 CDT
Aircraft Owner		Aircraft Operator	
Celestial Knights, LLC ████████████████████ Parker, CO 80134		Aaron Wisley Waters ████████████████████ Parker, CO 80134	
Report Information			
Air Safety Investigator: Ernest C. Hall		Report #: ASI-15-DK-T	Report date: 01-28-16

Airframe

Impact Sequence and Airframe Structure

The airplane collided with the trees, ground, telephone/power line pole, then a creek with about 2' water and came to rest inverted on the creek west embankment. There was no evidence of fire. The airplane was traveling east to west. The ground and tree impact damage indicate that the airplane's right wing fuel tip tank contacted the ground. The right propeller cut about a 4" diameter tree about 2' AGL that was about 9' southwest from the tip tank ground scar. About 10' southwest of the 4" diameter tree and about 11' AGL in a tree was remnants of the left main landing gear door rocker bellcrank assembly and engine control cables. The airplane continued downward and impacted the adjacent creek bed.

A portion of the fuselage, empennage, and the right wing came to rest inverted on the creek west side embankment. The portion of the fuselage and empennage came to rest on top of the right wing. The right and left engines were found imbedded into the bottom of the creek. The right and left propeller assemblies, the left elevator, a section of the left wing including part of the left main landing gear and a section of the nose landing were found submerged in the creek. A section of the right wing fuel tip tank, the left horizontal stabilizer, and a nose landing gear door was found on the creek east embankment.

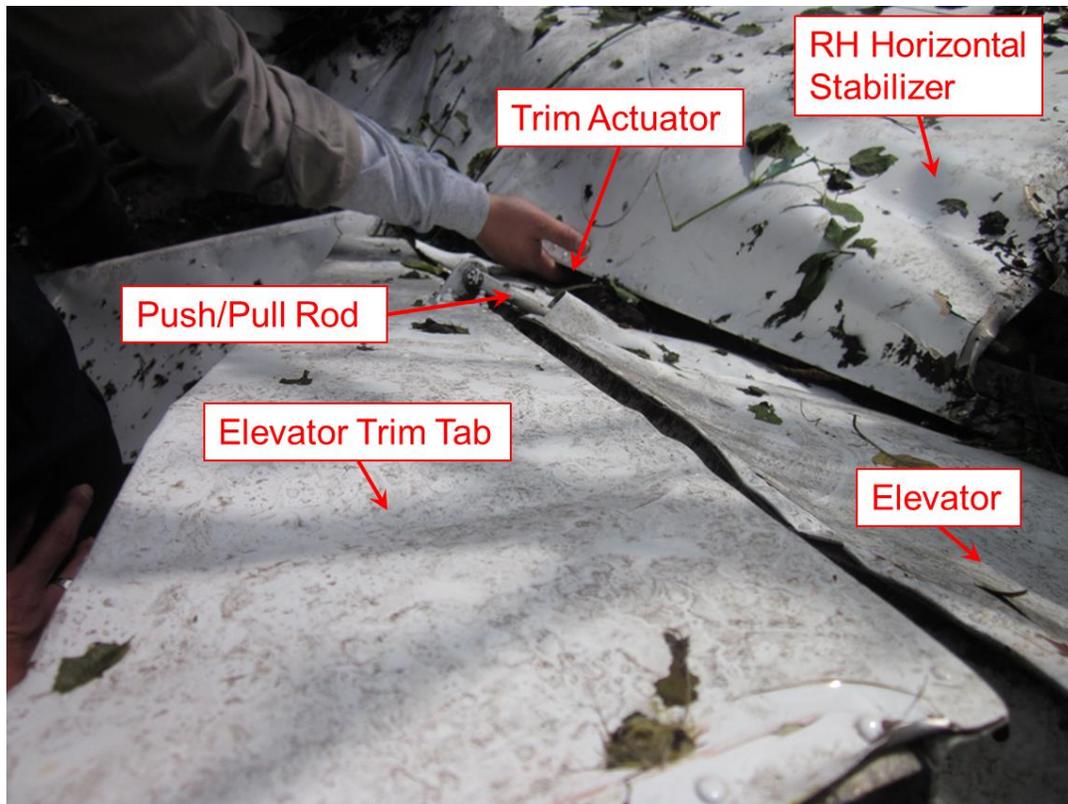
Airframe Systems

Flight Control System Information		
Control lock: Not installed		
Flight Control Cable Continuity		
Ailerons: Established	Elevators: Established	Rudder: Established
Aileron tab: Established	Elevator tab: Established	Rudder tab: Established
Flap and Trim Positions		
Flap actuator: Undetermined	Flap indicator: Undetermined	Flap handle: Undetermined
Elevator trim:	Actuator: ~5/8"=35 degrees down	Indicator: Unknown due to damage
Rudder trim:	Actuator: ~1"=5 degree right	Indicator: Unknown due to damage
Aileron trim:	Actuator: ~2"=21 degrees up	Indicator: Unknown due to damage

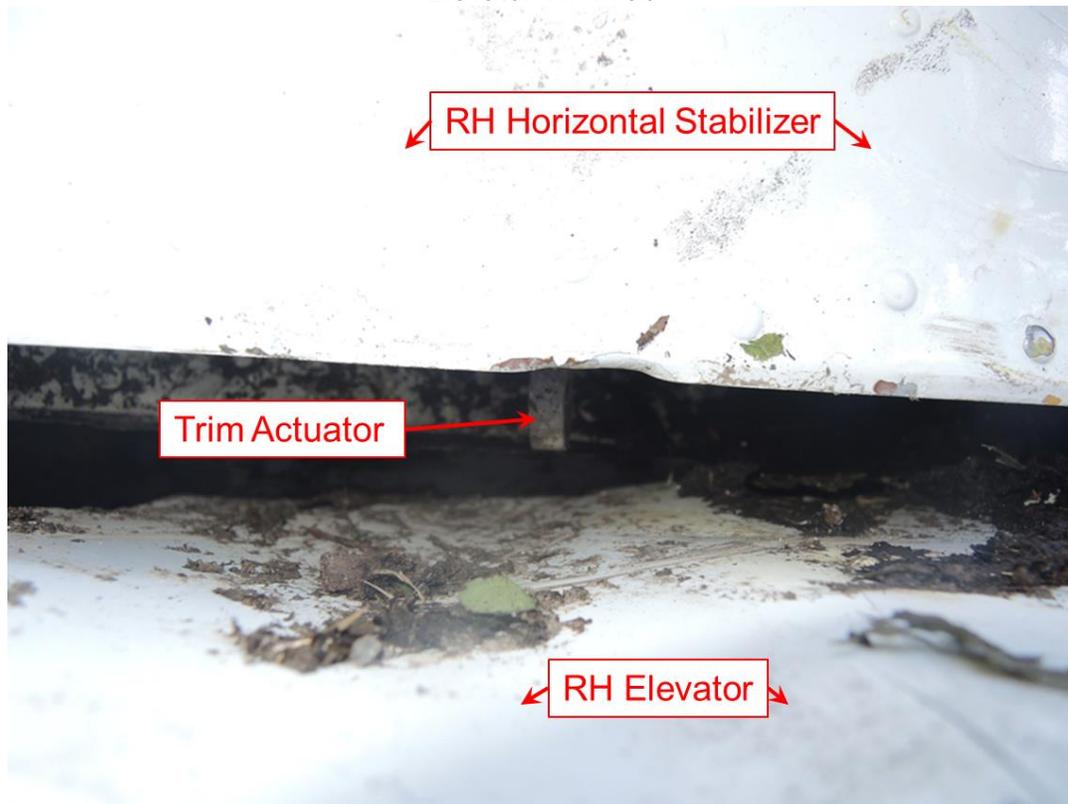
Remarks:

Continuity of all primary flight control cables was confirmed from the cockpit to their respective flight control surfaces with cable separations that exhibited signatures consistent with tensile over load.

The elevator trim actuator push/pull rod was found disconnected from the elevator trim actuator, but remained attached to the elevator trim tab. The attachment bolt was not observed. The right elevator, with attached trim tab, push/pull rod, and trim actuator, was retained by the NTSB for further examination at Textron Aviation Material and Process Laboratory. The elevator trim actuator extension was 5/8" which corresponds to a position exceeding travel limits for the trim tab trailing edge DN.



Elevator Trim Tab



Elevator Trim Actuator



Elevator Trim Actuator Push/Pull Rod

The flap motor/actuator was found separated from the airplane.

Airframe Fuel System Condition, Controls, and Read Outs					
Fuel strainer screen:		Left: Clean		Right: Clean	
Fuel strainer bowl:		Left: Clean		Right: Clean	
Main fuel tank gauge:		Left: Undetermined		Right: Undetermined	
Auxiliary fuel gauge:		Left: Undetermined		Right: Undetermined	
Locker fuel gauge:		Left: Undetermined		Right: Undetermined	
Locker transfer:		Left: Undetermined		Right: Undetermined	
Fuel selector handle:	Left: Undetermined	Fuel selector valve:	Left: See below	Fuel boost pump:	Left: Undetermined
	Right: Undetermined		Right: See below		Right: Undetermined
Crossfeed shutoff: Undetermined					

Remarks:

The right fuel selector valve and both fuel strainer bowls were found separated from each wing. The right fuel selector valve was found between the 'AUX' and 'Main' detents.

A strong odor of aviation gasoline consistent with 100LL was observed at the site.

Landing Gear System Condition and Controls			
Gear position:	Nose: Undetermined	Left: Undetermined	Right: Retracted
Actuator position:	Nose: See below	Left: See below	Right: See below
Landing gear selector: Undetermined		Aux gear control: Undetermined	
Environmental System Controls and Read Outs			
Cabin heater: Undetermined	Cabin vent: Undetermined	Defrost: Undetermined	
Air conditioner: Undetermined	Oxygen system: Undetermined	Oxygen quantity: Undetermined	
Icing System Information and Switches			
Certified into known icing? Undetermined		De-ice boots installed? Undetermined	
Pitot heat: Undetermined		Stall heat: Undetermined	
De-ice:	Surface: Undetermined	Propeller: Undetermined	Windshield: Undetermined
Anti-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable
ELT Information			
Installed? Yes	Manufacturer: Narco	Model: ELT 10	Type: (AP)(AF)
Serial number: A29191	Battery due date: 06-2016	Armed: Yes	Activated: Undetermined

Remarks:

The landing gear actuator was found in the retracted position.

Cabin and Equipment/Furnishings

Restraint System Information						
Seat	Occupied	Restraint type	Restraint used	Condition	Manufacturer	
1	Yes	Undetermined	Yes	Buckled, separated from airplane	Undetermined	
2	No	Undetermined	No	Undetermined	Undetermined	
3	No	Undetermined	No	Undetermined	Undetermined	
4	No	Undetermined	No	Undetermined	Undetermined	
5	No	Undetermined	No	Undetermined	Undetermined	
6	No	Undetermined	No	Undetermined	Undetermined	

Seat Condition Information					
Seat	Orientation	Feet intact	Back intact	Base intact	Rail intact
1	Forward facing	Partially	Partially	Yes	Partially
2	Forward facing	Undetermined	Undetermined	Undetermined	Undetermined
3	Forward facing	Undetermined	Undetermined	Undetermined	Undetermined
4	Forward facing	Undetermined	Undetermined	Undetermined	Undetermined
5	Forward facing	Undetermined	Undetermined	Undetermined	Undetermined
6	Forward facing	Undetermined	Undetermined	Undetermined	Undetermined

Remarks:

None

Instrument Panel

Navigation Instruments							
Analog primary instruments				Autopilot type: Undetermined			
Suction gage: Undetermined			Magnetic compass: Undetermined			Clock: Undetermined	
	Left side	Right side		Left side	Right side		
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				Stand-by battery: Undetermined			
Left alternator: Undetermined				Right alternator: Undetermined			
Avionics 1: 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 Positions							
Left engine:	Left magneto: Undetermined			Right magneto: Undetermined			
Right engine:	Left magneto: Undetermined			Right magneto: Undetermined			

Remarks:

The instrument panel was substantially damaged.

Powerplant Description

Engine Instruments					
Hour meter: Undetermined					
	Left engine	Right engine		Left engine	Right engine
Tach RPM:	Undt	Undt	CHT:	Undt	Undt
Manifold press:	Undt	Undt	Fuel press:	Undt	Undt
Oil press:	Undt	Undt	Fuel flow:	Undt	Undt
Oil temp:	Undt	Undt	Ammeter:	Undt	Undt
EGT:	Undt	Undt	Voltmeter:	Undt	Undt
Left Engine Control Positions					
	Cockpit	Engine		Cockpit	Engine
Throttle:	~1/2" from full forward, bent over to the right	Undetermined	Cowl flaps:	Undetermined	Undetermined
Mixture:	Full forward	Undetermined	Carb heat:	Undetermined	Undetermined
Propeller:	Full forward	Undetermined	Primer:	Undetermined	
Right Engine Control Positions					
	Cockpit	Engine		Cockpit	Engine
Throttle:	~1/2" from full forward, bent over to the right	Undetermined	Cowl flaps:	Undetermined	Undetermined
Mixture:	Undetermined	Undetermined	Carb heat:	Undetermined	Undetermined
Propeller:	Undetermined	Undetermined	Primer:	Undetermined	
Engine Condition					
	Left engine		Right engine		
Engine attached to airframe:	No		No		
Propeller attached to engine:	No		No		
Engine compression:	See below		See below		
Vacuum pump drive shaft:	Undetermined		Undetermined		
Valve train continuity:	See below		See below		
Engine Fuel System Condition					
	Left engine		Right engine		
Fuel pump drive shaft:	Intact		Intact		
Fuel injectors:	Undetermined		Undetermined		
Fuel control inlet screen:	Undetermined		Undetermined		
Distribution valve screen:	Undetermined		Undetermined		

Engine Magneto Condition						
	Left engine			Right engine		
Left magneto attached:	No			No		
Left magneto spark:	See below			Undetermined		
Right magneto attached:	No			No		
Right magneto spark:	No			No		
Left Engine Spark Plug Condition (per Champion Check-A-Plug Card)						
	1	2	3	4	5	6
Top	Normal	Normal	Normal	Normal	Normal	Normal
Bottom	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Right Engine Spark Plug Condition (per Champion Check-A-Plug Card)						
	1	2	3	4	5	6
Top	Normal	Normal	Normal	Normal	Normal	Normal
Bottom	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined

Remarks:

Both engines were found submerged in water. Both engines sustained impact damage.

According to the Continental Motors Investigator, the left and right engine magnetos and ignition harness were removed as were the top sparkplugs for each cylinder. The cylinders were photographed internally with a borescope. Mud, water, and normal combustion deposits were noted within each of the cylinders. No pre-accident anomalies were noted with the cylinders, valves, valve seats, rockers, or springs. Both engines were manually rotated at the engine crankshaft propeller flange and crankshaft and camshaft continuity were confirmed out to each piston and each rocker that retained their respective pushrods during the accident.

Spark was observed emitting from the left engine left magneto's distributor block, but the left engine right magneto would not produce a spark during drive shaft rotation. Only the right engine right magneto was recovered. The drive shaft was rotated with some binding noted. The magneto was disassembled and when the housing was removed the drive shaft rotated with some binding noted at the drive end. The distributor gear rotated freely. The points were intact and opened/closed with driveshaft rotation. No internal, pre-accident anomalies, besides water immersion and mud contamination, were observed with the magnetos.

Propellers

The left propeller hub was fractured and only two of the three blades were recovered with only a remnant of the hub remaining attached to one of the blades. The two blades displayed s-bending, and both were twisted toward low pitch. The pitch change link was fractured from the blade hub.

The right propeller hub was fractured and two of the three blades remained attached to the hub and were loose. The separated blade was recovered. All of the blades' pitch change links were fractured. All three blades were twisted toward low pitch. Blade #1 displayed heavy s-bending, leading edge gouging, and was bent in a u-shape. The #1 blade also displayed a chicken wire pattern on its camber side, and investigators observed chicken wire in one of the trees.

Research & Testing

On 09-28-15 and 09-29-15, the NTSB-led investigation team examined the elevator trim components at Textron Aviation Material and Process Laboratory.

The right elevator, trim tab, and trim actuator were removed from the scene and taken to Textron Aviation's laboratory for further examination. A section of the elevator upper skin was removed to examine witness marks in the leading edge spar of the elevator. Witness marks matching the forward push/pull rod clevis were consistent with the clevis hitting against the aft side of the front elevator spar after separation from the actuator. Additionally, the elevator push/pull rod guide hole edge exhibited signs of wear on the interior face, consistent with rubbing from the hardware of the connecting bolt. The forward end and bottom side of the trim tab push/pull rod clevis had impact marks consistent with contact with the elevator trim actuator eye-end.