

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

SUMMARY OF ACCIDENT SITE AND AIRCRAFT EXAMINATION

-- CEN17FA084 --

A. ACCIDENT

Location: San Antonio, Texas
Date: January 25, 2017
Time: 1539 central standard time
Aircraft: Cirrus Design SR22 airplane (s/n 0951), N401SC

B. PARTICIPANTS

Timothy Sorensen
Aviation Accident Investigator
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C. ACCIDENT SUMMARY

On January 25, 2017, at 1539 central standard time, a Cirrus Design SR22 airplane, N401SC, was destroyed during an in-flight collision with trees and terrain about one mile southeast of the Stinson Municipal Airport (SSF), San Antonio, Texas. The pilot was fatally injured. 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 for the flight, which was not operated on a flight plan. The flight originated from the San Antonio International Airport (SAT) at 1533.

Summary of Accident Site and Aircraft Examination

D. GENERAL DESCRIPTION

Airframe

The Cirrus Design SR22 is a four-place, low wing, single-engine airplane of predominantly composite construction, with a fixed (non-retractable) tricycle landing gear configuration. The airplane is certificated in the normal category. Aerobatic maneuvers, including spins, are prohibited. The airplane is equipped with the Cirrus Airframe Parachute System (CAPS) which is designed to lower the entire airplane to the ground in the event on an emergency.

Engine Assembly

The Continental Motors IO-550-N engine was a six-cylinder, normally aspirated, fuel injected design, capable of developing 310 horsepower at 2,700 rpm.

Propeller Assembly

The Hartzell PHC-J3YF-1RF propeller assembly was a three-blade, constant speed (variable pitch) design. The blades were fabricated from an aluminum alloy. The propeller governor utilized engine oil pressure routed through the propeller hub to maintain the required blade pitch.

E. DETAILS OF AIRCRAFT EXAMINATIONS

The NTSB investigator-in-charge (IIC) arrived on-scene on January 26, 2017. Initial documentation of the accident site was completed that afternoon. Final documentation of the site and a detailed examination of the airframe were conducted the following day. The airplane was subsequently relocated to Air Salvage of Dallas, Lancaster, Texas.

The engine was shipped to Continental Motors, Mobile, Alabama. A teardown examination of the engine was completed on July 17, 2017, under oversight of the NTSB IIC.

F. DESCRIPTION OF ACCIDENT SITE

The accident site was located in a wooded area about one-half mile southeast of the Stinson Airport at coordinates 29.3269° north latitude and 098.4581° west longitude. This was within the boundary of the San Antonio Missions National Historical Park.

Tree breaks were observed beginning about 105 feet from the airplane and were oriented on an approximate 050° bearing. The initial tree strike was about 25 feet above ground level. A ground impact mark about 10 feet long by 4 feet wide by 2 feet deep was located approximately 78 feet from the initial tree strike (27 feet from the airplane). The engine cowl oil access door, the CAPS fuselage cover, and the lower section of the right-side cabin door were lying on the ground within the perimeter of the ground impact mark. The airplane came to rest upright on an approximate 270° bearing.

The CAPS parachute deployment bag and rocket motor had separated from the fuselage. They were suspended in a tree near the ground impact mark. The parachute canopy remained packed within the deployment bag.

Summary of Accident Site and Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS¹

Airframe – Cirrus Design SR22, s/n 0951

The major airframe components were located in position relative to the fuselage. The forward fuselage was fragmented, and the cockpit and cabin areas were exposed. The engine, engine mount, and firewall were displaced about 75° to the right. The propeller remained attached to the engine, and the engine to the engine mount.

The instrument panel was dislocated and fragmented. The control yoke assemblies were dislocated and damaged consistent with impact. The left control yoke aileron input exhibited a discontinuity at the aileron actuation bracket. The bracket was fractured consistent with overstress. The separated portions of the bracket remained attached to the yoke and the aileron actuation push-pull rod. The aileron control cable remained attached to the aileron actuation pulley. The rudder-aileron interconnect assembly appeared intact. The left control yoke remained connected to the elevator torque tube assembly via the elevator actuation push-pull rod. The elevator control cables were secured to the torque tube. The rudder pedals remained attached to the torque tube assemblies. The rudder control cables remained attached to the torque tubes.

Both wings were dislocated and partially separated from the fuselage. They were located in position relative to the fuselage. The left wing remained attached to the center wing structure. The left wing tip was separated and located on the ground immediately below the remainder of the wing. The wing exhibited localized abrasions and deformation with corresponding delamination of the composite structure. An irregular cut into the leading edge about 9 inches deep and 3 inches wide was located about 2-1/2 feet from the wing root. The left aileron remained attached at the inboard hinge point. The outboard hinge remained attached to the aileron but was separated from the wing; the hinge fitting was deformed. The aileron exhibited denting and abrasions over the entire control surface. The aileron actuation pulley remained attached to the rear spar and appeared intact. The aileron control cables remained secured to pulley and were continuous to the wing root. The control pin remained attached to the aileron, but it was dislocated from the actuation pulley. The aileron trim actuator remained attached to the wing; however, it had separated from the actuation pulley. The fracture surface appeared consistent with an overstress separation.

The right wing was separated near mid-span, from the aerodynamic cuff outboard. The inboard portion of the right wing inboard of mid-span remained attached to the center wing structure. The outboard portion of the right wing was fragmented. The right wing tip and right aileron were located in the debris path, about 42 feet and 28 feet from the main wreckage, respectively. The aileron exhibited localized deformation, including a semi-circular impression near the outboard end consistent with a tree impact. The aileron actuation pin remained attached to the aileron and appeared intact. The aileron actuation pulley remained attached to the aft spar. Control cable continuity was confirmed from the pulley to the wing root. The right flap remained attached to the wing; the outboard hinge had separated from the flap.

The aft fuselage exhibited fractures of the composite structure consistent with impact. The horizontal and vertical stabilizers had both separated from the fuselage. They were

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

Summary of Accident Site and Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

located in position relative to the fuselage. The lower aft fuselage section common to the horizontal stabilizer, including the aft bulkhead, remained attached to the stabilizer. The left elevator remained attached to the horizontal stabilizer and appeared to be intact. The right elevator had separated and was located about 6 feet from the stabilizer. It was deformed; the counterweight remained attached. The torque tube remained attached to the left elevator. It had separated from the right elevator consistent with impact. Both torque tubes remained secured to the fuselage bellcrank. Elevator control cable continuity was confirmed from the bellcrank to the cockpit. The vertical stabilizer exhibited delamination and abrasions near the separation but appeared otherwise intact. The rudder remained attached at each hinge point. The upper and lower portions of the rudder were damaged consistent with impact but appeared otherwise intact.

The wing flap torque tube and control links remained attached to both flaps. The torque tube was bent consistent with impact. The flap actuator was separated at the torque tube flange rod end. The rod end remained attached to the torque tube; the separation appeared consistent with one-sided bending overstress fracture. The flap actuator was fully retracted consistent with full (100%) deflection. A stop collar was installed on the flap actuator.²

The CAPS safety pin was not installed in the activation handle.³ The activation handle was out of the holder; the upper fuselage (roof) structure was compromised. The CAPS enclosure cover was separated and located at the ground impact crater. The rocket motor, pick-up collar, lanyards and deployment bag were suspended from a tree adjacent to the ground impact crater. The parachute canopy remained packed within the deployment bag. The suspension lines, risers and harnesses were extended on the ground from the deployment bag to the main wreckage. The rear harness was not extended (remained snubbed). The reefing line cutters appeared intact and had not activated. The line cutters operated normally when activated on-scene. The rocket motor was expended. The base and launch tube remained attached to the airframe enclosure. Soot present on the launch tube was consistent with exhaust from the rocket motor.

The damage to the upper fuselage (roof) structure and the location of the enclosure cover in the debris path were consistent with an activation of the CAPS during the impact sequence. No pre-impact anomalies with respect to the CAPS were observed.

Engine – Continental Motors IO-550-N-27B, s/n 917210

The engine exhibited damage to the intake ducting and cylinder cooling fins consistent with impact. The oil sump was crushed upward and was breached. The engine mount supports on the left side of the engine were separated. The forward end of the crankshaft immediately aft of the propeller flange was bent and displayed radial cracking.

The engine was disassembled. The internal surfaces were oil wetted. The crankshaft was intact with exception of the bending at the propeller flange. The pistons, connecting rods, cam shaft, push-rods, journal bearings, rocker arms, and valves appeared undamaged.

² Installation of a stop collar is specified by Cirrus SB 2X-27-16 R2.

³ The safety pin is installed when the airplane is parked to prevent an inadvertent ground activation of the CAPS. The pin is removed as part of the pre-flight procedures so that the system is ready for use in an emergency. It should not be installed during flight.

Summary of Accident Site and Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(concluded)*

The accessory section gears appeared intact. The fuel nozzles were undamaged and clear, with exception of the no. 5 nozzle which was broken below the nut flange and the no. 6 nozzle which was bent at the nut flange.

The magnetos were partially separated, and the ignition harness was damaged. Each magneto provided a spark to each lead when tested. The spark plugs were intact and exhibited normal combustion signatures.

The fuel system components consisting of the engine driven fuel pump, the fuel manifold valve, lines and nozzles, and the throttle body bench tested within specifications after minor adjustments.

Propeller Assembly – Hartzell PHC-J3YF-1RF/F7693DFB, s/n 2844B

The propeller assembly remained secured to the engine propeller flange. The spinner was deformed to the hub and torn. All three propeller blades remained attached to the hub. Each blade was bent aft over the entire span. One blade was rotated within the hub.