



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

May 22, 2020

SUMMARY OF AIRPLANE EXAMINATION

(WPR19FA084)

This document contains 26 embedded photos.

A. ACCIDENT

Location:	Ely, Nevada
Date:	February 15, 2019
Aircraft:	Cirrus SR22, N917SR
NTSB Investigator-in-Charge	Thomas Little

B. EXAMINATION PARTICIPANTS

Thomas Little
Senior Aviation Accident Investigator
National Transportation Safety Board
Federal Way, Washington

Donald F. Morgan
Aviation Safety Inspector
Nevada Flight Standards
Reno, Nevada

Brad Miller
Cirrus Aircraft
Manger, Aircraft Investigations
Duluth, Minnesota

Chris Lang
Continental Motors
Air Safety Investigator
Mobile, Alabama

C. SUMMARY

On February 15, 2019, about 1730 Pacific standard time (PST), a Cirrus SR22, N917SR, was destroyed following impact with terrain while maneuvering at a low altitude, about 3.4 nautical miles (nm) north-northeast of Ely Airport (ELY), Ely, Nevada. The private pilot and passenger received fatal injuries. 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. Instrument meteorological conditions prevailed at the time and not flight plan was filed. The flight originated from Craig-Moffat Airport (CAG), Craig, Colorado, about 1525 mountain standard time, and was destined for Twin Falls Regional Airport (TWF), Twin Falls, Idaho.

The airplane's wreckage was located the following afternoon, February 16, about 3.4 miles northeast of ELY. During the afternoon of February 17, representatives from the NTSB, the FAA, and Cirrus Aircraft arrived at the accident site to assess the damage. The airplane was observed to have impacted shallow, upslope, snow-covered terrain, in a level and slightly nose down attitude. The post-impact debris path was oriented on a measured magnetic heading of about 065 degrees, and extended over a linear distance of about 473 ft. The airplane's at rest heading was not possible to determined, due to the destructive nature of the impact forces and total fragmentation of the airplane. All components of the airplane necessary for flight were accounted for at the accident site. The airplane was recovered to a secured location for further examination on February 19, 2019.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site Examination

The initial point of impact consisted of a roughly 5-foot wide by 12-foot long, 6-inch-deep crater, located at 39.33404 degrees north latitude; and -114. 77972 degrees west longitude, at an elevation of 6,884 feet msl. A Sheriff's Deputy had measured the debris field using a measuring wheel and found the debris field to be 474 feet long. The energy path was oriented

on a magnetic heading of approximately 67° and on a 10-degree uphill slope of a mountainous ridgeline. The debris field was roughly 200 feet wide at its widest point.

Based on the damage observed to the right side of the wing, the upper engine cowl, and nose landing gear strut, the airplane impacted terrain upright and in a slight right-wing low attitude. Subsequent to initial impact, the airplane fragmented. No evidence of a fire was noted. All components necessary for flight were accounted for within the debris field.

2.0 Follow-up examination notes

A follow-up examination of the airframe and engine, which was conducted at the facilities of Air Transport, Phoenix, Arizona, on April 3, 2019, and overseen by representatives from the NTSB and the FAA, revealed the following:

2.0.1 Airframe examination notes

The following airframe examination notes were provided to the NTSB IIC by a Cirrus Aircraft Senior Air Safety Investigator, as a result of an onsite and postaccident examination of the airframe.

The carry through wing was observed separated from the fuselage. The left side of the spar, torque box structure, and wing skins were present. The right-side of the spar, the torque box structure, and wing skins were fragmented. Both fuel tanks were breached.

The left and right ailerons and flaps had separated from the wing and exhibited impact damage.

The roll trim motor position was near the full left trim position.

The flap motor was not observed.

The forward aileron control cable was continuous from the right-hand (RH) turnbuckle to the left-hand (LH) turnbuckle, and its ball swage was captured in the console actuation pulley. The RH & LH turnbuckles both had safety clips in them.

The RH aileron control cable was separated aft of the RH turnbuckle. The separation was visually consistent with having been cut. The RH aileron control cable ball swage was captured in the right aileron actuation pulley, which had separated from the wing. The crossover pulley remained attached to the cable between the ball swage and cross-over turnbuckle. The RH aileron control cable was attached to the cross-over turnbuckle and the turnbuckle safety clip was present. The right kickout pulley was observed at the accident site with a control cable routed through it.

The LH aileron control cable was attached to the cross-over turnbuckle. A cross-over pulley remained attached to the cable between the cross-over turnbuckle and the ball swage on the

cable. The cable and ball swage were separated from the left aileron actuation pulley. The cable was separated aft of the LH turnbuckle and the separation was visually consistent with tension overload. The left kickout pulley was not observed.

The horizontal stabilizer was observed separated from the empennage and exhibited impact damage. The left and right elevators separated from the horizontal stabilizer and exhibited impact damage. The pitch trim motor position was near the full up position. The elevator cables both remained attached to the bellcrank weldment under the instrument panel. Both cables were separated forward of the turnbuckles. The separations were visually consistent with having been cut. The aft portion of the elevator control cables remained attached to their respective bellcranks in the FS306 bulkhead. The vertical stabilizer separated from the empennage and exhibited impact damage. The rudder remained attached to the vertical stabilizer and exhibited impact damage. The rudder control cable that was color-coded blue was continuous from the rudder pedal stanchion to the bellcrank in the FS306 bulkhead and remained attached at both ends. The rudder control cable, which was color coded yellow, remained attached to the rudder pedal stanchion and was continuous to a separation located about 12 to 18 inches forward of the turnbuckle. The cable aft of the separation remained attached to the. The separation was visually consistent with having been cut. The yellow cable length was the same as the blue cable's length.

Pieces of all three landing gear were noted in the debris field. The nose landing gear leg was bent backwards at the top and slightly offset to the left.

Fragments of both cabin doors were noted in the debris field. The baggage door was not observed.

The ignition switch was in the BOTH position. No other switch positions were noted.

Fragments of all four seats, each of which was located in the debris field, which each having exhibited impact damage.

The Avidyne PFD was located in the debris field. Its chassis was torn open; the circuit cards on the interior were not all present. All circuit cards in the immediate vicinity of the accident site will be sent to the vehicle recorders lab for further examination.

The Avidyne MFD was not located during the on-site portion of the investigation.

FAA records indicated that the airplane had been retrofitted with an Avidyne DFC90 autopilot. The DFC90 was located by the recovery personnel and sent to the NTSB for download.

The Cirrus Airframe Parachute System (CAPS) enclosure panel was located in the debris field. A fragment of the aircraft roof, which contained the CAPS activation handle and handle holder was observed in the debris field. The rocket motor remained in the launch tube with its frangible link intact. The parachute enclosure was separated from the bulkhead and the

parachute was observed on the ground in the immediate vicinity and remained in a packed state.

The Cirrus representative removed the propellant grains from the rocket and disposed of them. No anomalies noted with the CAPS system.

The examination of the airframe failed to reveal any anomalies that would have prevented normal operation.

2.0.2 Engine examination notes

The following engine examination notes were provided to the NTSB IIC by a Continental Motors Air Safety Investigator, as a result of the investigator's post-recovery examination of the engine. The examination was overseen by representatives from the NTSB and the FAA.

The engine had been recovered from the accident site and placed on a table for the examination. The engine exhibited severe impact damage and most of the accessories were separated from the engine and located with the airframe wreckage. The crankshaft propeller flange was fractured from the crankshaft and was not found in the wreckage. The crankshaft exhibited 45° shear lips and radial cracking.

The majority of airframe wreckage and the separated engine accessories were in large bags that were utilized by recovery team during the onsite recovery of the wreckage.



Figure 1 - photo of engine as received

Induction System

- The induction system was impact separated from the engine and various induction system pieces were noted within the aircraft wreckage. The induction manifold exhibited impact damage, but the throttle moved freely by hand.



Figure 2 - photo of induction system

Ignition System

Magnetos

- The left magneto, serial number D08IA313, was impact separated from the engine and located within the aircraft wreckage. The mounting flange was fractured, and the magneto points cover was broken away exposing the points to damage. The magneto drive turned freely by hand with impulse coupling engagement. No spark was produced due to the impact damaged points. The magneto was disassembled and no preimpact anomalies were noted.



Figure 3 - left magneto



Figure 4 - left magneto

- The right magneto, serial number D08IA307, was impact separated from the engine and located within the aircraft wreckage. The mounting flange was fractured, and magneto

points cover was broken away exposing the points to damage. The magneto drive turned freely by hand with impulse coupling engagement. No spark was produced due to the impact damaged points. The magneto was disassembled and no preimpact anomalies were noted.



Figure 5 - right magneto



Figure 6 - right magneto

Ignition harness

All twelve of the ignition harness leads were damaged and cut in multiple places.
photo



Figure 7 - ignition harness leads



Figure 8 - ignition harness leads

Spark plugs

The top spark plugs were removed, and the bottom spark plugs examined with a lighted bore scope. The spark plugs exhibited light colored combustion deposits and normal electrode wear.



Figure 9 – top spark plugs



Figure 10 - bottom spark plugs

Fuel System

- Fuel pump - The engine driven fuel pump remained attached to the engine and exhibited impact damage to the mixture control arm and the aneroid. Several of the fuel line fittings were fractured. The engine driven fuel pump was removed, and the drive coupling was intact. The mixture control moved freely by hand from stop to stop. The engine driven fuel pump was disassembled and no preimpact anomalies were noted



Figure 11 - engine driven fuel pump

Fuel Manifold Valve

- The fuel manifold valve was located in the airframe wreckage and was still attached to the induction manifold. The fuel manifold valve was disassembled, and the fuel screen was clean. The diaphragm was intact, and the retaining nut was secure.



Figure 12 - fuel manifold valve

Lubrication System

Oil sump

- The oil sump was impact separated from the engine.



Figure 13 - oil sump

Oil pick-up tube and screen

- The oil pick up tube and screen were pushed up into the bottom of the crankcase but showed no signs of blockage.

Oil pump

- The oil pump was disassembled, and oil was noted in the pump. The gear teeth and housing showed normal wear and no signs of hard particle passage.



Figure 14 - oil pump



Figure 15 - oil pump

Oil cooler

- The oil cooler was separated from the engine and exhibited impact damage.



Figure 16 - oil cooler

Cylinders

- The cylinders remained attached to the crankcase and all exhibited varying degree of impact damage. The number five cylinder head was partially missing and the intake valve was loose and bent. The cylinder combustion chambers were inspected with a lighted bore scope and no pre-impact anomalies were noted.



Figure 17 - #5 cylinder

Accessory gears

- Continuity from the front of the engine to the rear of the engine was observed through the bottom of the crankcase

Starter

- The starter was impact separated from the starter adaptor and located within the airframe wreckage.



Figure 18 - starter

Starter Adapter

- The starter adaptor remained attached to the engine and the starter mounting flange was broken.

Alternator

- The alternator was impact damaged.



Figure 19 - Alternator

Turbos

- The turbo chargers were impact separated from the engine and damaged. One turbo charger was broken in half with the compressor scroll and compressor wheel separated. The turbine and compressor wheels exhibited blade damage opposite of rotation and some outer pieces of the blades were missing.



Figure 20 - turbocharger

Turbo Controller

- The controller was found loose in the airframe wreckage and damaged.



Figure 21 - turbo controller

Wastegate

- The wastegate were impact damaged.



Figure 22 - wastegate

Overboost Valve

- The overboost valve was still attached to the induction elbow and exhibited light impact damage.



Figure 23 - overboost valve

Propeller Governor

- The propeller governor was impact separated from the engine and not observed in the wreckage.



Figure 24 - propeller governor

Propeller

- The propeller hub and crankshaft propeller flange were fractured from the crankshaft and not observed with the wreckage. Two damaged partial composite propeller blades were found in the wreckage.



Figure 25 – two partial Hartzell propeller blades (front view)



Figure 26 – two partial Hartzell propeller blades (rear view)

The examination of the engine failed to reveal any anomalies that would have prevented normal operation and production of horsepower.