



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

February 25, 2020

# **AIRFRAME / ENGINE EXAMINATION SUMMARY**

**WPR20FA034**

This document contains 0 embedded photos.

## **A. ACCIDENT**

Location: North Las Vegas, Nevada  
Date: November 26, 2019  
Aircraft: Cirrus SR-22  
NTSB Investigator-in-Charge: Joshua Cawthra

## **B. PARTICIPANTS**

IIC: Joshua Cawthra  
National Transportation Safety Board  
Federal Way, Washington

Participant: Brad Miller  
Cirrus Aircraft  
Duluth, Minnesota

Participant: Chris Lang  
Continental Motors Inc.  
Mobile, Alabama

## **C. SUMMARY**

Examination of the recovered wreckage at the facilities of Air Transport, Phoenix, Arizona, was conducted on February 25, 2020. No evidence of any preimpact mechanical malfunction that would have precluded normal operation of the engine and airframe was found.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Airframe Examination**

The fuselage was fragmented and fire damaged. Portions of the fuselage and empennage was not observed within the recovered debris.

The wing was fragmented and fire damaged. Various portions of the aileron controls cables were recovered and multiple separations within the cables were noted. All fracture surfaces appeared to be consistent with overload separation.

Portions of the rudder control cable were located within the recovered debris with multiple separations noted consistent with either overload separations or cut by recovery personnel.

The landing gear was separated from the wing and impact damaged. The nose wheel assembly and lower portion of the strut were not observed within the recovered debris.

The left and right doors were separated from the fuselage and were mostly intact with some impact damage noted.

The ignition switch was located and observed in the "both" position.

The Cirrus Airframe Parachute (CAP) activation handle was in handle holder. The activation cable housing was destroyed by fire; however, the cable housing weave still present along length of cable. About a 1ft section of cable housing weave was missing about 1 to 2 ft aft of the handle holder. The rocket base was partially consumed by fire. The rocket propellant was expended, and fire damage was present. The parachute was not located within the recovered wreckage.

## **2.0 Engine Examination**

The engine (Continental IO-550-N (7), s/n: 685760, was separated from the engine mounts and exhibited severe impact damage to all 6 cylinders. The propeller, left and right magnetos, throttle body fuel control unit, fuel manifold valve, portions of the induction system, exhaust, starter, propeller governor, and standby alternator were separated. The starter drive assembly, fuel pump and main alternator remained attached. The propeller governor, starter, standby alternator, and oil filter were not located.

The crankcase exhibited impact damage. The oil sump was compressed upward. All of the cylinders except for cylinder number 4 were examined internally using a lighted borescope. Aside from impact related damaged, all cylinders were unremarkable. Holes were drilled into the upper area of the crankcase. The internal components of the engine were examined visually using a lighted borescope and were found to be unremarkable.

The engine driven fuel pump was intact, with multiple fittings separated. The driveshaft coupling was intact. The mixture arm was bent and precluded movement. The driveshaft was rotated by hand. The fuel pump was disassembled and exhibited normal operational signatures.

The fuel manifold valve exhibited impact damage to the outer case. The unit was disassembled, and the internal diaphragm was torn in the area of the damaged outer case.

The throttle body was impact damaged. The throttle plate shaft was bent. The throttle arm splines were disengaged due to the bent shaft.

The right magneto exhibited impact damaged. The internal points, distributor gear was not located.

The left magneto exhibited impact damage. When the driveshaft was rotated by hand, the magneto produced spark on all ignition leads. The impulse coupling functioned when the driveshaft was rotated.

The ignition harness was impact damaged.

The upper spark plugs were impact damaged. All upper spark plugs (not including cylinder no. 4), were removed. Light gray combustion deposits within the electrode area and exhibited normal operational signatures.

All 6 fuel injector nozzles were impact damaged.

The propeller had all 3 propeller blades remain attached to the propeller hub. One blade was fairly straight and exhibited leading edge and trailing edge gouges, along with multi directional striations of the forward side of the propeller blade. The second propeller blade exhibited an aft bend about mid span about 60 to 70°. The propeller blade had leading edge and trailing edge gouges and multi directional striations on the forward side of the propeller blade. The third blade exhibited an aft bend almost 90° bend near the propeller hub and was bent forward near the blade tip about 90°. The blade also exhibited twisting throughout, along with leading edge and trailing edge gouges along with chordwise striations. Separation area of the crankshaft aft of the propeller flange exhibited 45° sheer lips, consistent with overload.

Submitted by: Joshua Cawthra