

Following the aircraft recovery of N91HC from Pomona's Brackett Field (POC) an FAA Inspector from the Los Angeles FSDO examined the aircraft at the Aircraftsmen Inc. Hangar B-350 at Chino Airport, on January 5, 2015. The contractor engine teardown was supervised by Mr. Mark Wilson the President of Aircraftsmen Inc located at Chino Airport, CA.

The airplane had been disassembled during the recovery process. The 4 major separated sections consisted of the following: (1) Rt. wing, (2) empennage aft of flight station 152.2. The engine (3) and remnants (4) of the center fuselage section from FS.18 to FS.138.0 which were completely destroyed during the post-crash fire.

Airframe

The main cabin area (FS.18 aft to FS.138.0) had been consumed by fire, with only remnants of the instrument panel (Figure 1) remaining as recognizable, cabin structural integrity was lost.

The left-wing was separated from the airframe during the crash sequence and all but a small portion of the outboard section of the left wing remained where it had impacted the AAA Sign at the Pomona Raceway outboard of WL. 155.00 remained and was found at the accident scene and was a part of the investigation. The rest of the left wing had been burned beyond recognition. We are unable to make any additional determinations from the wreckage remaining materials on the left wing because of thermal damage.

The right wing was partially scorched, sustained some superficial scratches and damage during the crash sequence, it had remained loosely attached to the airframe at the accident scene. The maintenance contractor was able to recover 2 gallons and 1 quart of fuel from the Rt. Wing according to the contractor the wing had not been subject to water at the accident scene but only foam. The aileron and flap remained attached to the Rt. Wing. The contractor found water in the fuel sample form the Rt. Wing which very well may be a contributory factor in this accident.

The empennage section consisted of the vertical stabilator and rudder, with a portion of tail skin remaining through FS. 194.8. Thermal damage was present to the bottom of the tail section. The rudder remained affixed to the stabilizer, and control continuity was established from the control surface to the rudder turnbuckle, where what cables that remained had been affixed.

The fuel system had been severely compromised by the fire, and investigators were unable to establish continuity from the wing through the fuselage to the main engine fuel pump. The fuel selector was found, and removed from the deformed cabin area it would not rotate due probably to the post crash fire. Compressed air was forced through the Right wing fuel cell, and air was observed to egress from the "right tank" fuel vent.



Engine

The Teledyne Continental TSIO-520-R1B had been converted to an M variant per the data plate – the fuel injected engine was examined following recovery of the wreckage; the serial number was recovered from the data plate because it was found intact. S/n: 512148. An external examination of the engine revealed that cylinder fins and outer cooling fins were crushed and bent on the left side of the engine. After the spark plugs had been removed the cylinder heads were bore-scoped with no internal cylinder anomalies identified during that internal inspection. The right magneto was removed from the engine and it produced spark and there was continuity to the spark plug wires ends. The exhaust system was observed to have sustained ductile bending and crushing aft of the turbo-charger. The turbo-charger exhibited no apparent damage and rotated freely by hand.



Figure 2 – Teledyne Continental TSIO- 520-RCM, S/n: 512148, Engine Exhibit from N91HC examination 01/05/2016.

The ignition harnesses were attached from both magnetos to their respective spark plugs. The magnetos remained securely attached to their respective mounts. Investigators removed the right magneto and attempted to test their internal continuity via hand rotation. The top spark plugs were removed; no mechanical damage was noted and the electrodes and posts exhibited no abnormal or remarkable color markings. Figure 3. The fuel injection mechanical linkage was unremarkable to where all of the linkage was burned below the engine. Continuity of the fuel system was indeterminate.

Disassembly of the fuel selector valve had been requested by the NTSB Investigator which the contractor was unable to comply with, he indicated the component would require to be sent to a

repair station (Mike's A/C Fuel Metering Service, Tulsa, OK.) the selector was frozen as depicted in Figure 3.



Figure 3 - Shows Top Sparkplug Exhibit's and Fuel Selector Valve from N91HC examination 01/05/2016.

Investigators rotated the engine via the main crankshaft and the cam and crankshaft exhibited no anomalous indications. Internal mechanical continuity was established during rotation of the crankshaft and upon attainment of thumb compression in all cylinders. The valves rotated in concert with the camshaft rotation in a normal fashion. Visual inspection of the combustion chambers was accomplished through the spark plug bores; there was no evidence of foreign object damage or detonation, and no indication of excessive oil consumption. The valve train was observed to operate in proper order and equal lift action occurred at each rocker assembly. The oil dripping from the crankcase appeared normal since the date on the oil-filter was dated 01/11/2015.

The vacuum pump remained secure to its mounting pad. There was no visible evidence of damage. The rotor/vane assembly was also intact and undamaged.

The three bladed Hartzell propeller (PHC-J3YF-1RF, S/n: 118)- blades were observed attached to their hub assemblies, which were attached to the propeller shaft flange. The propeller blades were torsionally twisted and exhibited an "S" bend.

There was no evidence of mechanical malfunction or failure with the airframe or engine.