

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA23FA330

ENGINE EXAMINATION

October 26, 2023

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A. ACCIDENT

Location: Junction City, Georgia
Date: August 10, 2023
Time: 1005 EDT
1405 UTC
Airplane: Cessna P210N; N210JT

B. ENGINE EXAMINATION

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C. SUMMARY

On August 10, 2023, about 1005 eastern daylight time, a Cessna P210N, N210JT, was substantially damaged when it was involved in an accident near Junction City, Georgia. The pilot was fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The airplane departed Sarasota/Bradenton International Airport (SRQ), Sarasota, Florida about 0800 with a destination of Thomaston-Upson County Airport (OPN), Thomaston, Georgia. The airplane was operating under an instrument flight rules flight plan and had been cruising at flight level 200 (20,000 ft msl). About 1005, Atlanta Terminal Radar Approach Control lost radar and radio contact with the airplane during its enroute descent. Preliminary review of Automatic Dependent Surveillance-Broadcast (ADS-B) track data and weather radar showed the flight track entering an area of heavy precipitation which was followed by the airplane entering a rapidly descending right turn. The wreckage was located approximately 0.3 miles northeast of the last ADS-B position in a heavily wooded area.

The main wreckage came to rest on its left side and a postaccident fire consumed a majority of the fuselage including the cockpit area.

D. DETAILS OF THE EXAMINATION

1.0 Engine Examination

The propeller gearbox was separated from the engine and remained attached to the propeller. The accessories section displayed thermal signatures consistent with a post-crash fire. The left side of the engine was impact crushed inward with the left discharge tube embedded in the horizontal fireshield. The N1 and N2 systems were locked when rotation was attempted by hand via the compressor and fourth stage turbine wheel respectively. All the external lines and connections displayed varying amounts of bending and several were fractured.



Photo 1: View of the left side of the engine as received. (Photo Courtesy of Rolls Royce)



Photo 2: View of the back of the engine as received. (Photo Courtesy of Rolls Royce)

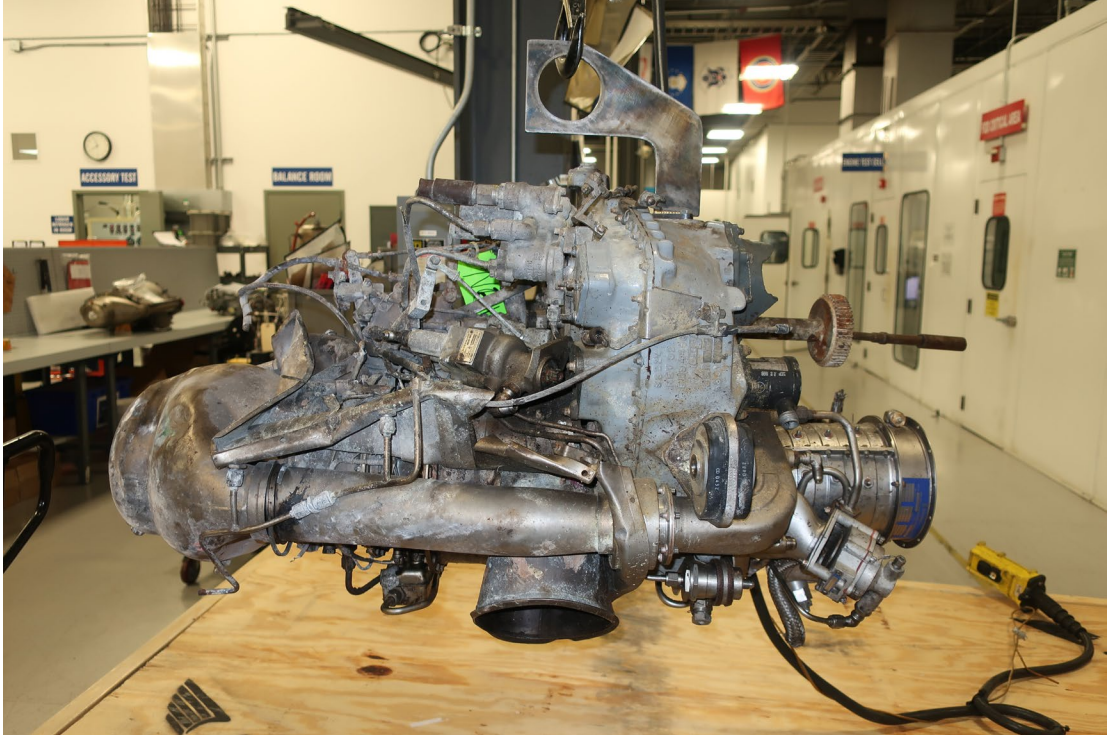


Photo 3: View of the right side of the engine as received. (Photo Courtesy of Rolls Royce)



Photo 4: View of the front of the engine as received. (Photo Courtesy of Rolls Royce)

1.1 Accessories

The fuel control unit driveshaft was intact and turned with some binding. The drive body was cracked longitudinally. The air and fuel line connections were fractured and bent. The unit was not disassembled.

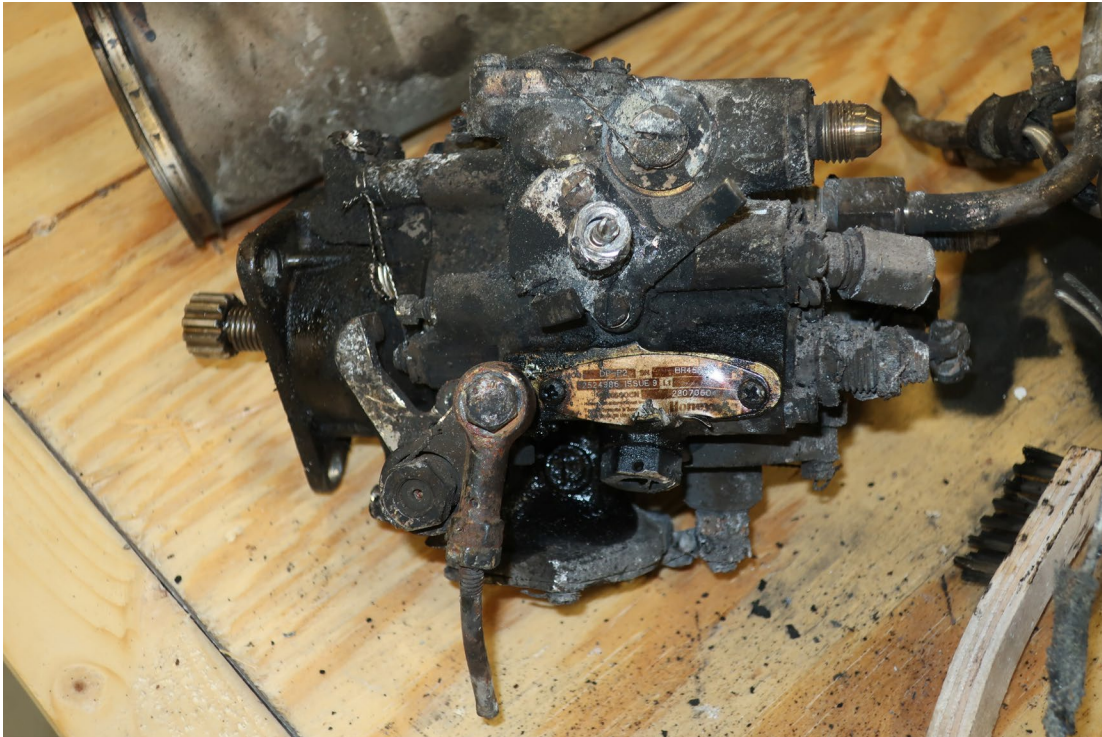


Photo 5: View of the fuel control unit. (Photo Courtesy of Rolls Royce)

The propeller overspeed governor and driveshaft splines were generally intact and the driveshaft did not turn. The unit was not disassembled.



Photo 6: View of the propeller overspeed governor.



Photo 7: View of the propeller overspeed governor driveshaft.

The fuel pump was removed, and the driveshaft remained lodged in the gearbox. The fuel filter element was inspected and was clean with some residual fuel in the bowl.



Photo 8: View of the fuel pump.

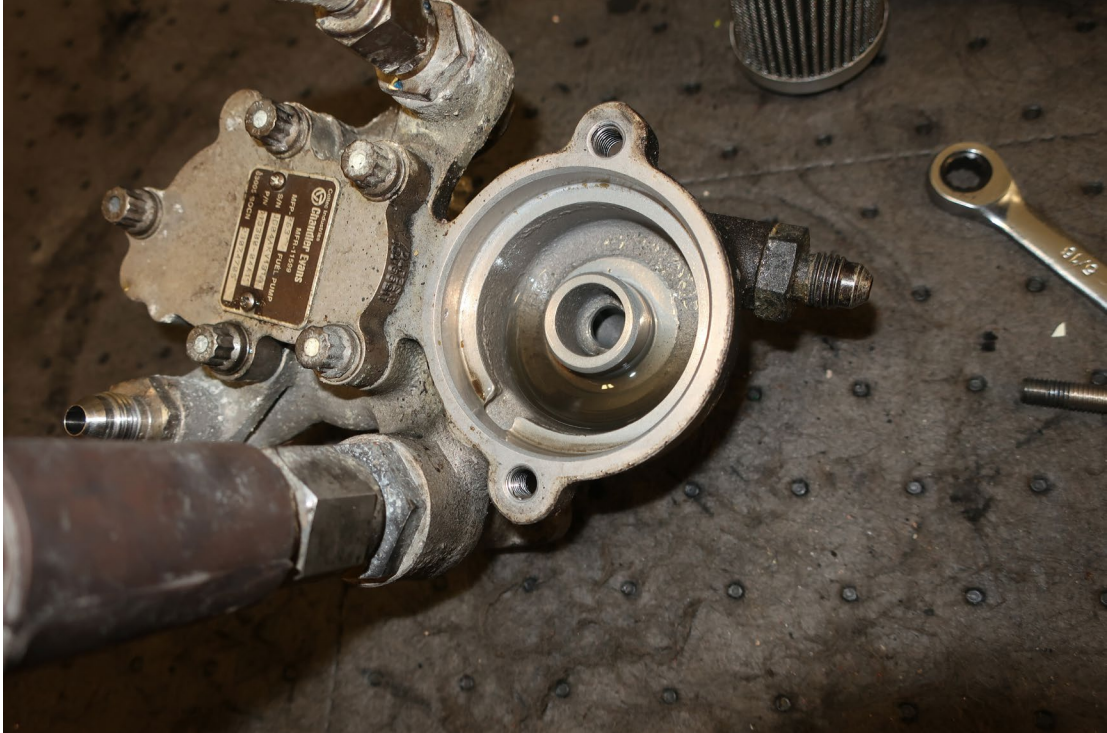


Photo 9: View of the fuel pump bowl with residual fuel. (Photo Courtesy of Rolls Royce)



Photo 10: View of the fuel pump filter. (Photo Courtesy of Rolls Royce)

The fuel nozzle was visually clear and displayed no obvious blockages on the primary and secondary orifices. The nozzle was dark brown in appearance and was not disassembled.



Photo 11: View of the fuel nozzle. (Photo Courtesy of Rolls Royce)

The compressor bleed valve was normal in appearance and the valve was fully open. The valve closed with normal resistance and no binding. The bleed valve was not disassembled.



Photo 12: View of the compressor bleed valve. (Photo Courtesy of Rolls Royce)

The propeller governor remained on the propeller gearbox and was not examined.

1.2 Turbine

Once the turbine module was removed from the gearbox, the N1 and N2 rotors remained frozen. The N1 and N2 shafts were intact. The N2 shaft was bulged and bent slightly and the N1 shaft displayed slight flaring at the forward end. The power turbine support was removed from the exhaust collector to view the second and third stage turbine wheels and third stage turbine nozzle, which were intact and normal in appearance. The No. 6/7 bearing sump displayed coked oil which was dark in appearance. The fourth stage wheel was observed through the exhaust collector and no missing or fractured blades were noted. The first stage nozzle shield, first stage nozzle, and several first stage blades were viewed via borescope through the combustor with no significant damage noted. The interior of the combustion liner and exterior of the outer combustion case were crushed inward. The Nos. 5 and 6 bearings were intact. The Nos. 7 and 8 bearings were not observed.



Photo 13: N1 and N2 shafts (Photo Courtesy of Rolls Royce)

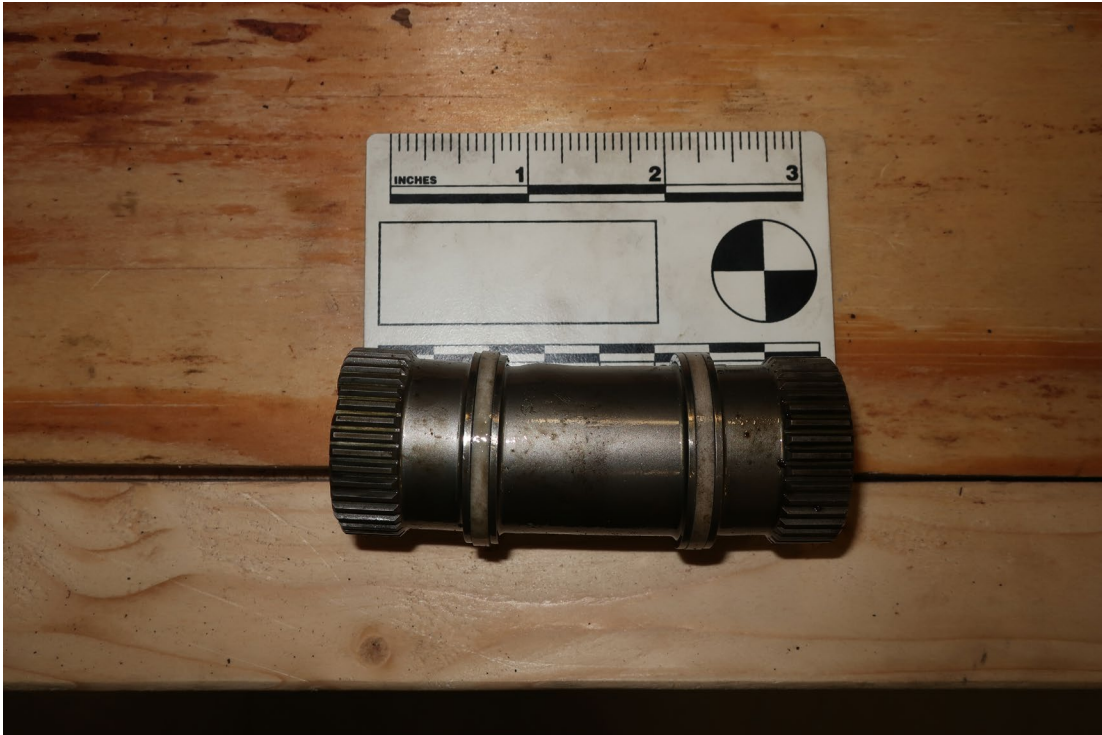


Photo 14: View of the N2 shaft. (Photo Courtesy of Rolls Royce)



Photo 15: View of the turbine section. (Photo Courtesy of Rolls Royce)

1.3 Gearbox

The left trunnion mount was fractured from the housing, leaving a hole in the case. Once the turbine was removed, the N2 geartrain was continuous and turned slightly. The gearbox N1 train was locked. The upper and propeller Magnetic Chip Detectors (MCD) were clean while the lower MCD tip displayed minimal non-ferrous brown debris. Visual observation of the geartrains through the turbine bore revealed no anomalies. The gearbox was not disassembled.



Photo 16: View of the lower MCD. (Photo Courtesy of Rolls Royce)



Photo 17: View of the upper MCD. (Photo Courtesy of Rolls Royce)



Photo 18: View of the propeller MCD. (Photo Courtesy of Rolls Royce)

1.4 Compressor

The compressor was completely disassembled. There was no obvious Foreign Object Damage (FOD) noted on the compressor inlet or first stage blades. The compressor rotor did not rotate. The No. 1 bearing was normal in appearance, oil wetted, and rotated smoothly. The No. 2 bearing spun freely and was normal in appearance. All the compressor vanes and blades were intact with no significant circumferential rub damage noted on the impeller

shroud or blade tracks. However, individual gouges were noted on all four stages of compressor blade tracks on the upper case half. Corresponding gouges were noted on a portion of the impeller shroud as well. The spur adapter gearshaft was fractured and bent near the aft splines.



Photo 19: View of the compressor blades.



Photo 20: View of the impeller and impact gouges on the impeller shroud.



Photo 21: Individual gouges on the upper case half. (Photo Courtesy of Rolls Royce)

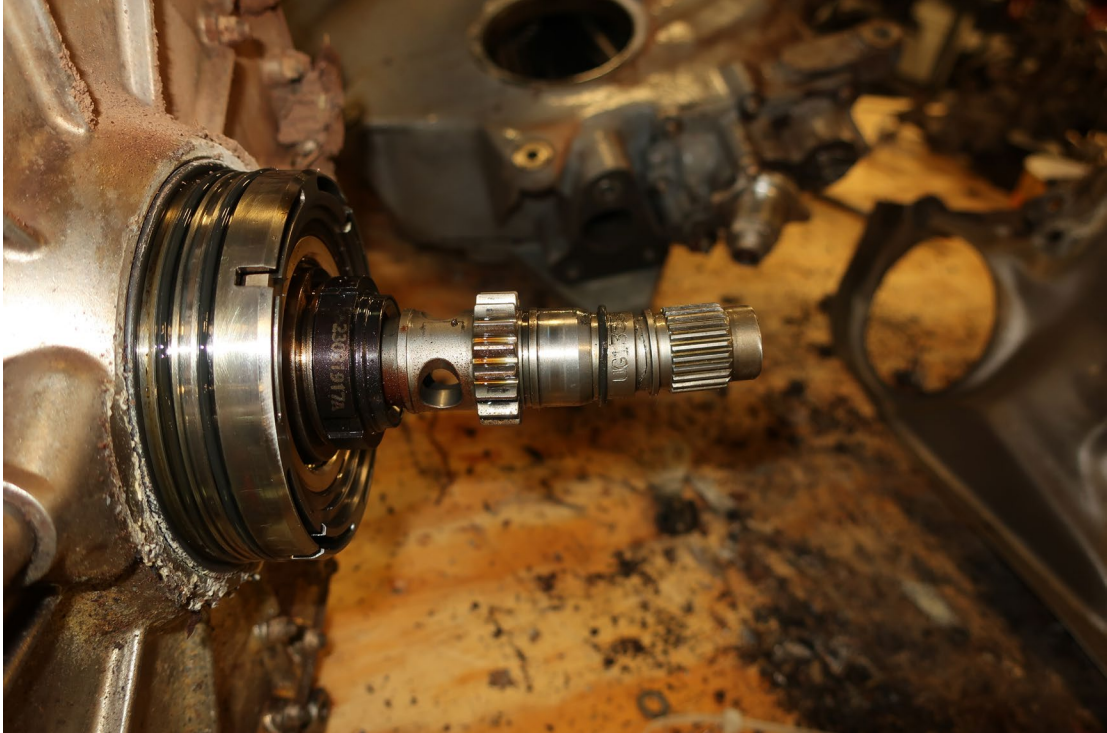


Photo 22: View of the spur adapter gearshaft (Photo Courtesy of Rolls Royce)

2.0 Propeller Gearbox

The propellor gearbox was fractured from the engine and remained attached to the propellor. Both units were previously viewed by the IIC during the wreckage inspection and therefore not viewed during the engine exam.

Submitted by:

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Air Safety Investigator