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Division: ERA, AS

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Subject: ERA21FA354

SUMMARY OF ENGINE EXAMINATION

The airplane was recovered and taken to Colonial Air in New Bedford, MA, for further examination, which took place on September 12 and 13, 2021.

Examination of the left engine revealed it sustained impact and fire damage. The fuel pump was removed, and the coupling was intact. The pump would not rotate due to heat damage. The upper spark plugs were removed, and the rocker covers removed. The engine was then rotated by manual rotation of the crankshaft flange. Compression and valve train continuity were established for each cylinder. The fuel pump spline was also observed rotating. The left and right magnetos and their respective ignition leads were removed. The coupling for each magneto was rotated using a power drill. The right magneto produced spark to each terminal. The left magneto did not produce any spark due to heat damage. The fuel manifold was removed and disassembled. The diaphragm was heat damaged, but the screen was absent of debris. A small amount of water and fuel was found in the manifold chamber. The fuel injectors were clogged with debris. The lower spark plugs were removed, and all spark plugs appeared to exhibit normal wear as per the Champion Check-A-Plug chart. The fuel injector screen was removed and found absent of debris. The oil filter was removed and opened. The entire filter assembly sustained extensive heat damage, and the filament had turned to ash. However, no metallic debris was observed. The magnetic oil sump plug was absent of any significant metallic debris.

The metering unit screen was removed and found absent of debris. The throttle cables were positioned for "full power" and the mixture cable was in the "idle cutoff" position." The turbo exhibited heat damage but rotated.

No mechanical deficiencies were observed with the left engine that would have precluded normal operation at the time of impact.

Examination of the right engine revealed it sustained some impact and fire damage. The fuel pump was removed, and the coupling was intact. The pump would not rotate due to heat damage. The upper spark plugs, and rocker covers were removed. The engine was then rotated by manual rotation of the crankshaft flange. Compression and valve train continuity were established for each cylinder. The fuel pump spline was also observed rotating. The left and right magnetos and their respective ignition leads were removed. The coupling for each magneto was rotated using a power drill. Both the left and right magnetos produced spark to each terminal. The fuel manifold was removed and disassembled. The diaphragm was heat damaged, but the screen was absent of debris. A small amount of water and fuel was found in the manifold chamber. The fuel injectors were clear of debris. The lower spark plugs were removed, and all spark plugs appeared to exhibit normal wear as per the Champion Check-A-Plug chart. The oil filter was removed and opened. The entire filter assembly sustained extensive heat damage, and the filament had turned to ash. However, no metallic debris was observed.

The metering unit screen was removed and found absent of debris. The throttle cables were positioned for "full power" and the mixture cable was in the "idle cutoff" position. The turbo rotated freely. The engine was not equipped with a magnetic oil sump plug and it was not removed.

No mechanical deficiencies were observed with the right engine that would have precluded normal operation at the time of impact.