

**NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594**

SUMMARY OF ENGINE/AIRFRAME EXAMINATION

-- CEN20LA118 --

DETAILS OF EXAMINATION

A post-recovery engine examination was conducted at AMF Aviation, LLC, Springfield, TN. The airframe sustained significant fire/thermal damage.

Engine

- Engine with attached engine mount had been removed from the airplane and was suspended from a lift for the examination.
- Valve covers removed and rockers/springs were in place
- Spark plugs were removed: three of the spark plugs were oil soaked, otherwise the plugs appeared dark gray and worn normal condition.
- The turbocharger's turbine/compressor shaft was free to rotate by hand; no damage to the turbine or compressor blades were noted.
- Both magnetos were in place. The magnetos produced spark at all terminals when rotated by hand.
- Continuity was established thru the valve train, rear accessory section, when engine was rotated by hand.
- The throttle and mixture control cables remained attached to the control arms. The fuel inlet screen was absent of debris.
- The engine driven fuel pump drive spline rotated freely; no damage was noted to the internal components.
- A thumb suction and compression test was performed on each cylinder, no abnormalities noted.
- The engine cylinders were borescoped with no abnormalities noted.
- The oil was observed in the engine; the suction screen and oil filter media were absent of debris.
- The 3-bladed propeller remained attached to the crankshaft flange. The first blade was curved aft about 90 degrees and exhibited longitudinal twisting toward the blade face. The second blade was twisted toward the bladed face about mid-span. The third blade was curved aft about 90 degrees and exhibited longitudinal twisting toward the blade face.

Airframe

- The fuselage was largely consumed by the post crash fire and limited the scope of the examination.
- The nose landing gear was extended, consistent with landing gear in the down position.
- The flight control cables remained attached to their respective T-bar attach points and control continuity was established thru impact and recovery separations to their respective flight control surfaces.
- Flaps consistent with the up position.
- The stabilator trim and barrel assembly were indicative a neutral stabilator trim setting.
- The stabilator control cables remained attached to their respective attach points and were recovery separated in the fuselage area; the upper stabilator control cable was again separated at turn buckle located in the tailcone. The surface of the separated ends of the turnbuckle were flat in appearance consistent with overload separating; the sections were sent to the NTSB lab for further examination.
 - The NTSB lab noted the cable and turnbuckles were consistent with fractures from intergranular fracture. A few of the wires in the cable fracture exhibited dimpled rupture, consistent with fracture from overstress.
 - The Lab noted that that the cable likely survived the ground impact intact, only to fracture after exposure to the post-crash fire while still under tension.

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