



MEMORANDUM FOR RECORD

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Subject: ERA19LA149 – Examination of Airplane

An examination of the airplane and engine after the accident revealed:

Exterior:

- Spinner exhibited impact marks with power lines.
- The engine section was attached and canted upward, and the left fuselage was bent and fractured forward of the cockpit.
- The propeller blade remained attached to engine
- The leading edge of one propeller blade exhibited wire strike marks midspan.
- The fuselage aft of the wings and the empennage were impact damaged and crushed forward
- The trailing edge of the left wing was impact damaged along most of its length.
- The left wing evidenced a wire-tear from the leading edge to mid-wing.
- Several cups of fuel were recovered from the left wing fuel tank, which was fractured.
- The vertical stabilizer and rudder were fractured and crushed toward the right horizontal stabilizer.
- The left horizontal stabilizer was attached to tail and the elevator was impact crushed.
- The right horizontal stabilizer and elevator were intact, and impact crushed.
- The right wing trailing edge was impact the entirety of its length.
- The right wing exhibited a puncture fracture near the wing root and the right wing fuel tank was devoid of fuel.

Interior/Cockpit:

- Throttle, Propeller and Mixture were full forward.
- Master Switch ON
- Fuel Pump ON
- Manifold Pressure 29 IN. HG. LBS
- Tachometer 1649.23

- Fuel Selector LEFT TANK
- Landing Gear – DOWN
- Flaps set to first notch
- Magnetos: OFF (no key)
- Hobbs 484.6

Interior/Controls:

- Flight control continuity was established from controls in cockpit to all flight control surfaces

Engine/Fuel Examination

- No anomalies noted in exterior engine inspection
- Propeller would not rotate
- Removed air filter cover: free of obstruction from induction to fuel servo
- Removed fuel strainer: $\frac{3}{4}$ full of blue liquid consistent with 100LL; tested with water paste; no water detected
- Tested fuel selector: no anomalies noted
- Removed and examined fuel flow divider: diaphragm intact and free from corrosion and contaminants
- Removed top spark plugs: all plugs normal when compared to Champion Check-A-Plug card; plug No.3 oil fouled
- Removal of rocker covers revealed large amounts of oil in Cylinders No. 1 and 3
- Borescope of cylinders revealed excess oil cylinders No 1 and 3 but no other anomalies noted
- Impulse coupling could be heard when propeller (previously hydraulically blocked due to oil) was hand rotated; confirmed continuity to accessory section/vacuum pump
- Vacuum pump coupler intact
- Thumb compression on all cylinders when propeller rotated; sparks noted at each magneto lead.
- Magneto timing: right magneto found at 24°; Left magneto found at 23° (Data plate: 20°)
- Pulled fuel injectors, no obstructions noted
- No. 3 air induction tube was found to contain $\sim \frac{1}{2}$ c oil
- No. 3 exhaust pipe contained $\sim \frac{1}{2}$ c oil
- Removed lower spark plugs: all plugs normal when compared to Champion Check-A-Plug card; plugs No.1 and 3 oil fouled
- Removed oil filter: no anomalies noted
- Removed and examined No. 3 cylinder: no anomalies noted
- Examined fuel injectors: clean and clear
- Engine driven fuel pump was full of fuel when fuel lines were removed
- Engine driven fuel pump removed and actuated by hand: displaced fuel through pump
- Electric boost pump tested: no anomalies noted

- Removed and retained fuel servo, nozzles and flow divider
- Fuel lines clear between flow divider to nozzles; free from obstruction and allowed passage of air



Figure 1: View of Wreckage from Right



Figure 2: View of Wreckage from Front



Figure 3: View of Wreckage from Left

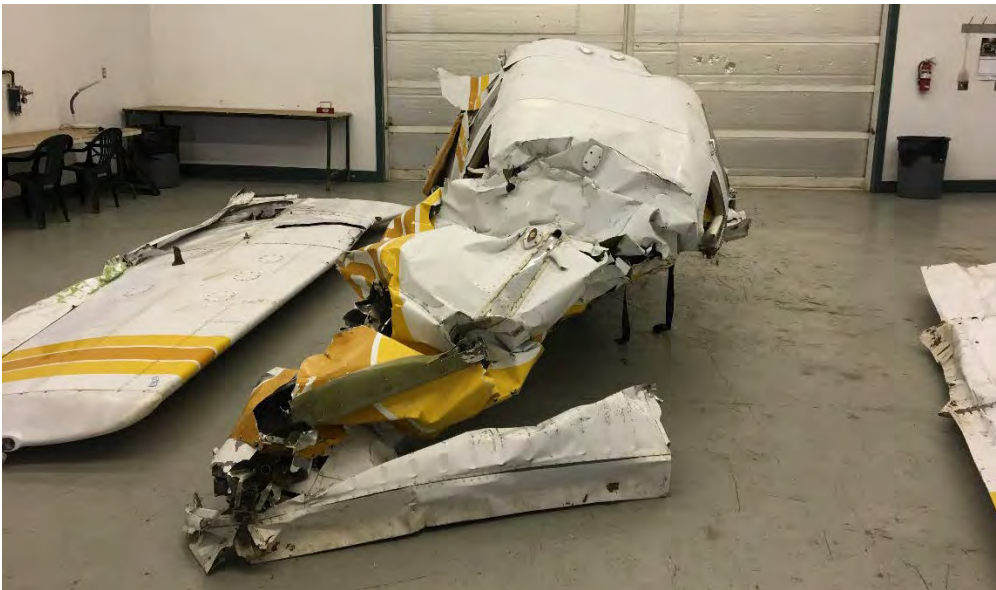


Figure 4: View of Wreckage from Rear



Figure 5: View of Uncowled Engine (Photo Courtesy of Piper Aircraft)



Figure 6: Air Intake and Filter Free from Obstruction (Photo Courtesy of Piper Aircraft)



Figure 7: Fuel Strainer (Photo Courtesy of Piper Aircraft)



Figure 8: Fuel in Strainer Tested Free from Water (Photo Courtesy of Piper Aircraft)

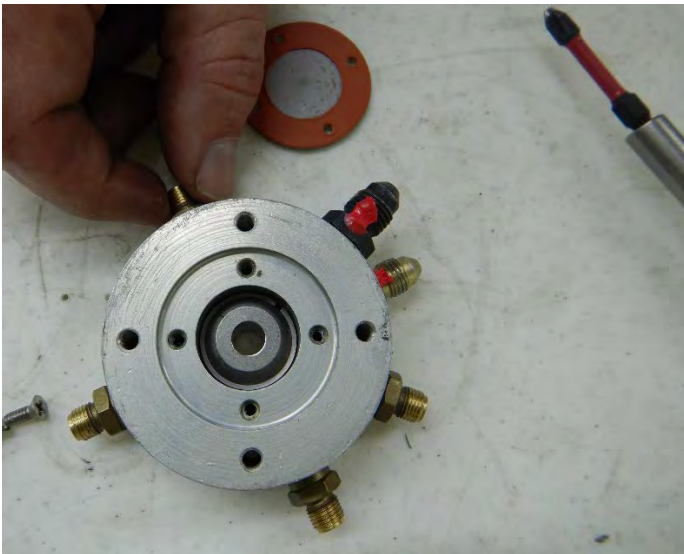


Figure 9: Fuel Flow Divider and Diaphragm



Figure 10: Rocker Covers Removed from Cylinders Nos 3 and 1



Figure 11: No. 3 Cylinder Head and Piston (Photo Courtesy of Piper Aircraft)



Figure 12: No. 3 Intake Valve and Spring (Photo Courtesy of Piper Aircraft)



Figure 13: No. 3 Exhaust Valve and Spring (Photo Courtesy of Piper Aircraft)



Figure 14: Spark Plugs