



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

September 8-9, 2019

AIRFRAME AND ENGINE EXAMINATION

ERA19FA265

This document contains 12 embedded photos.

(8 Pages)

1.0 EXAMINATION PARTICIPANTS:

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2.0 SUMMARY

The examination of N767FS was conducted on September 8-9, 2019 at Florida Air Recovery, Jacksonville, FL. Initial examination of the airframe revealed no preimpact anomalies. Examination of the engine revealed no preimpact anomalies that would have precluded normal flight. The elevator trim actuator control assembly and a Dynon Primary Flight Display were retained for further examination.

3.0 DETAILS OF THE INVESTIGATION

3.1 Airframe Examination

The airplane was significantly fragmented and partially consumed by a postcrash fire. The wreckage was laid out at the recovery facility. Both wings were crushed aft from the leading edge against the main spar, and from the trailing edge forward to the main spar. The right flaperon was impact and fire damaged, and the inboard half was separated from the wing. The left flaperon was impact and fire damaged and completely separated from the wing. The fuselage forward of the stabilator was severely fragmented and partially fire damaged. The stabilator, vertical stabilizer, and rudder were separated from the aft fuselage. The stabilator was largely intact, with most of the fire and damage near its center. The stabilator spar was fractured at midspan. The pitch trim tab remained attached to the stabilator; however, the input control rod and attachment bracket were fractured and separated from the trim tab. The rudder remained attached to the vertical stabilizer; it was damaged and the lower 4 inches of the trailing edge was bent toward the right.

Flight control continuity was established from the stabilator and the rudder from the control surface to the cockpit controls. Flaperon control continuity could not be established due to impact and fire damage. Control push-pull rod ends remained attached at the main cockpit control tube, and on the flaperon input control tubes. The fuel selector valve was not located. The

electric fuel boost pump was found sooted and thermally damaged. The nose landing gear was separated from the airplane.

Layout of canopy fragments revealed no evidence of bird impact/snarge.

3.2 Airframe Exam Photos



Photo 1: Wreckage Layout



Photo 2: Propeller



Photo 3: Left Wing Leading Edge

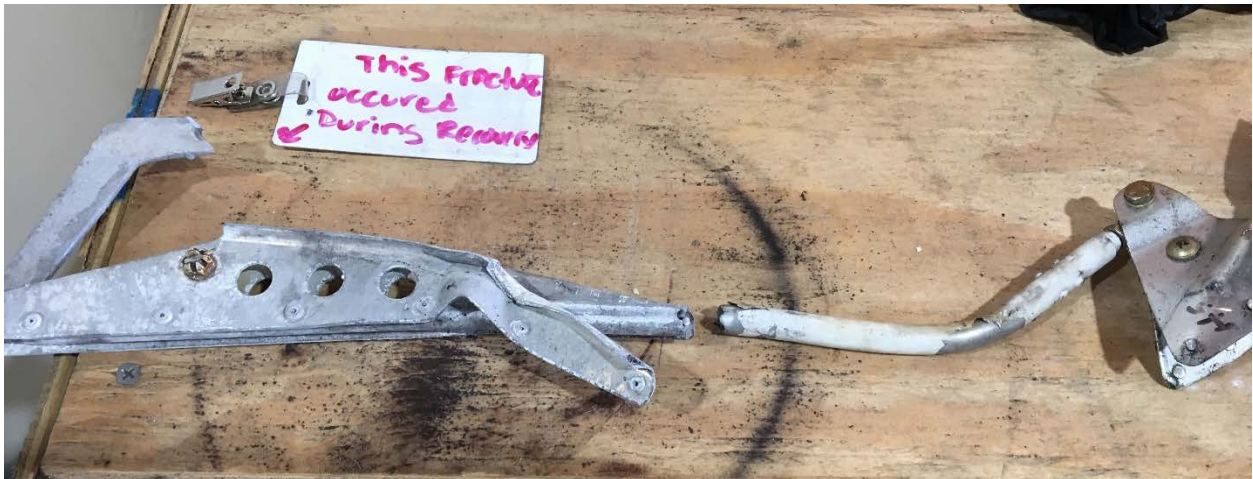


Photo 4: Elevator Trim Actuator Control Assembly



Photo 5: Canopy Fragment Layout

3.3 Engine Examination

One partial circumferential scrape mark was present on the front of the engine case near the main drive gear. The engine would not rotate by hand. A borescope inspection of all four cylinders revealed normal coloration and condition of the piston tops, cylinder walls, and valves. All rocker arms and valve spring assemblies remained intact and were undamaged. Cylinder head No. 3 was coated in soot. The gascolator was breached by a puncture, empty of fuel, and contained a small amount of debris in the filter screen. The inside of the gascolator bowl was sooted. Both carburetors were thermally damaged and separated from the engine and found hanging by their control cables. Each throttle control cable remained attached to its respective control arm on the carburetor. Both carburetor bowls were melted away and the floats were not present. Both slides remained in place but were unable to move. The sparkplug electrodes and insulators appeared normal and were clean, except for the No. 2 top spark plug which had white deposits on the bottom of the electrode. The Nos. 1 and 3 bottom sparkplugs were slightly wet with oil. None of the intake or exhaust manifold tubing remained attached to the intake and exhaust ports of the engine. The muffler remained partially attached and the springs were in place, with the case, inlet and exit tubes partially damaged. The engine driven fuel pump remained attached to the engine case; however, the fittings were separated, and the ports were partially fractured. The pump was removed and could be rotated by hand with some binding. A small amount of debris was found inside the pump, primarily on the side exposed by the fractured fitting port.

3.4 Engine Exam Photos



Photo 6: Engine Before Exam

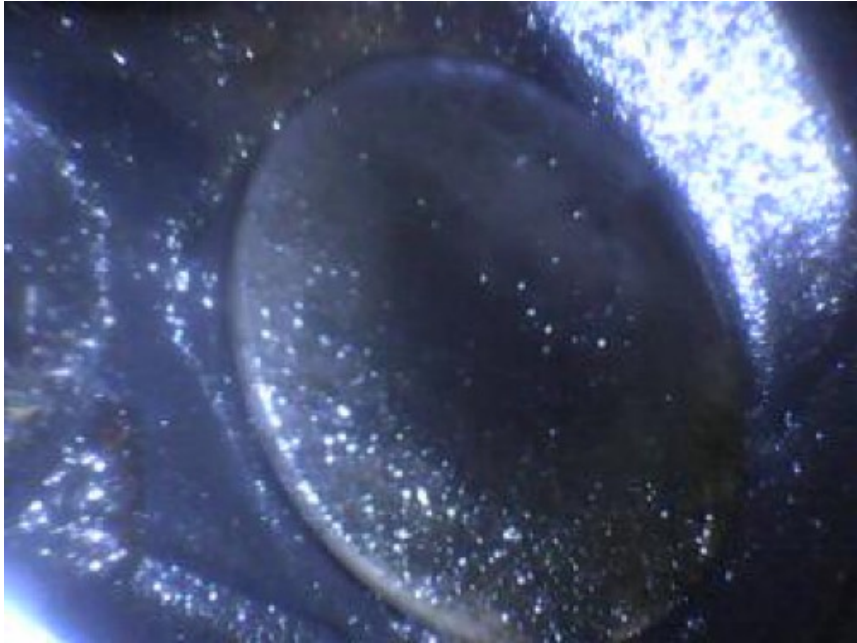


Photo 7: Borescope Cylinder 2

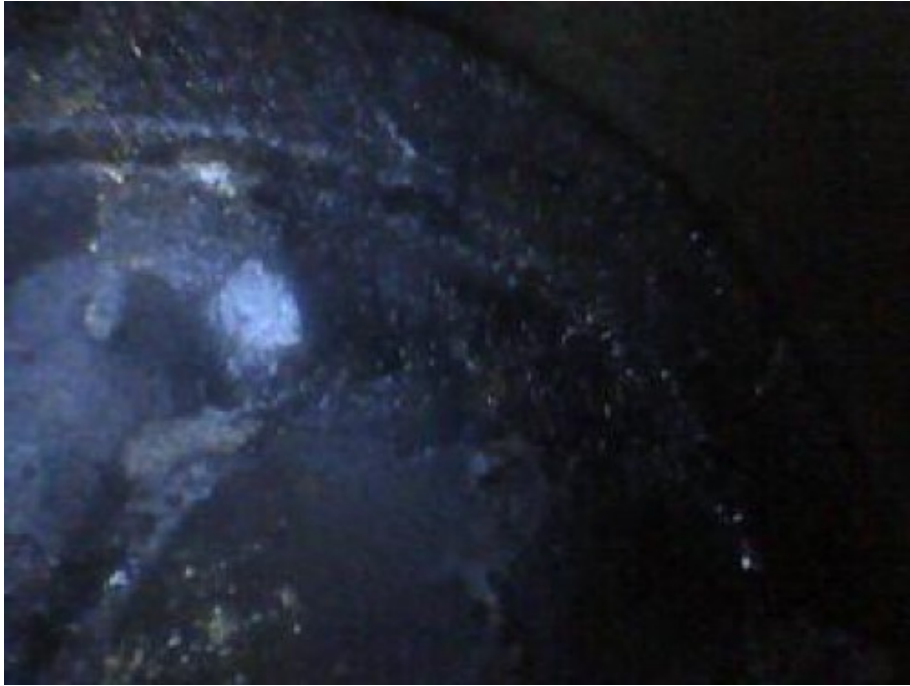


Photo 8: Borescope Cylinder 2



Photo 9: Borescope Cylinder 4



Photo 10: Borescope Cylinder 1



Photo 11: Borescope Cylinder 3



Photo 12: Close-up of Engine

Submitted by: Lynn Spencer