



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

August 9, 2017

AIRFRAME AND ENGINE EXAMINATION

WPR17LA158

This document contains 8 embedded photos.

A. ACCIDENT

Location: Ontario, California
Date: July 19, 2017
Aircraft: Enstrom F28C, Registration #5697B, Serial #505-2
NTSB IIC: Samantha Link

B. EXAMINATION PARTICIPANTS:

Samantha Link
Aviation Accident Investigator
National Transportation Safety Board
505 South 336th Street, Suite 540
Federal Way, WA 98003

Patrick Jones
Air Safety Investigator
National Transportation Safety Board
505 South 336th Street, Suite 540
Federal Way, WA 98003

Mark Platt
Air Safety Investigator
Lycoming Engines
652 Oliver Street
Williamsport, PA 17701

Robert Michaelson
Aviation Safety Inspector
Federal Aviation Administration
6961 Flight Road
Riverside, CA 92504

C. SUMMARY

Examination of the airframe and engine was conducted on August 9, 2017 at the facilities of South West Aircraft Recovery and Transport in Chino, California. No anomalies were noted during the examination.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

- Flight control continuity was established from the cockpit controls to the rotor head
 - One of the pitch change links was fractured at the bellcrank attachment point
 - Fracture was consistent with overload
 - The bellcrank responded accordingly when the cockpit controls were manipulated.
- The tail rotor gearbox housing was fractured and the tail rotor assembly was completely separated from the airframe.
 - The tail rotor blades remained attached to their hub and both sustained damage
- The tail rotor drive shaft was turned and rotation was observed at the tail rotor gear up to the main rotor mast
 - The sprag clutch was intact and was operationally tested

- The rotor tachometer was disconnected at the drive shaft and a drill motor was connected. The gauge was functionally checked.
 - The tachometer drive gearbox “O” rings were intact at their respective pullies
- The main drive belt remained intact, undamaged, and properly positioned. The belt tensioning mechanism remained intact and functional.
- The three main rotor blades remained intact
 - The blades exhibited coning signatures and cordwise scratching striations across the lower blade surface.

2.0 Engine Examination

- Engine model: HIO-360-E1AD, Serial #L-17611-51A
- The engine cowling was removed
 - The engine remained situated in the helicopter as normal
 - No evidence of catastrophic mechanical malfunction or preimpact fire
- Control continuity was established from the engine controls to the cockpit controls.
- The bottom spark plugs were removed
 - Consistent with normal operations per the Champion check-a-plug chart
 - Free of mechanical damage or discoloration
- The engine was rotated at cooling fan in direction of normal rotation
 - Impulse coupling was heard clicking
 - Thumb compression was established in proper firing order on all 4 cylinders
- Cooling fan rotated freely in both directions
- Spark plugs were reinstalled and the helicopter was prepared to conduct an engine run

3.0 Engine Run

- The helicopter was started using normal procedures
 - When the master switch was turned on, smoke came from the instrument panel. The helicopter was shut down and the instrument panel housing was removed
 - Further examination revealed the RPM mechanical tachometer cable was resting, and arcing, against the shunt terminal strip. The wire was discolored and extremely hot to the touch.
 - In addition, there was a nearby antenna in the instrument panel that also exhibited a melted area. It is unknown what this antenna was for.
- The wires were secured away from the terminal strip and the helicopter was started with no difficulty or anomalies.
 - No fuel or oil leaks were observed
 - Operating pressures and temps were normal

- o The engine tachometer was operational
- o Once the engine was warmed to operating temperature the throttle was advanced and the magnetos were checked using the ignition switch.
 - The magneto drops were found within manufacturer specifications
- o Cylinder temperatures were checked utilizing a hand held infrared thermometer
 - The temperatures were normal
- o The engine was responsive to throttle changes
- o The manifold pressure gauge was operational

4.0 Photos



Figure 1: Instrument Panel



Figure 2: Sides of Engine



Figure 3: Tail Rotor



Figure 4: Main Drive Belt



Figure 5: Bottom Spark Plugs



Figure 6: RPM Mechanical Tachometer Cable



Figure 7: Main Rotor Blades



Figure 8: Main Rotor Blades

END.

Submitted by: Samantha Link