



RECORD OF EXAMINATION

Mitchell Gallo
Aviation Accident Investigator
Central Region

NTSB Accident Number: CEN18FA182

Narrative:

The helicopter was resting on its left side beneath the power line structure in marsh grass/water terrain and was submerged in about 3 feet of water. The main wreckage consisted of the fuselage, skids, main rotor head with 2 blades attached, and a portion of the tail boom. A 5-foot section of tail boom and tail rotor driveshaft were in trees adjacent to the main wreckage. The aft section of tail boom, to include the tail rotor assembly, was about 25 feet south of the main wreckage. Two main rotor blades were about 100 feet south of the main wreckage, and one main rotor blade was about 50 feet south of the main wreckage. The canopy structure was fragmented, and the left cockpit/cabin door and right cockpit door frames were crushed and deformed. The lower fuselage sustained damage in the area where all four struts pass through the fuselage. The left forward landing gear strut was fractured, and the left aft strut was undamaged. The left and right skids were intact.

The tailboom had partial separations near its forward fuselage attachment and near the horizontal stabilizer. Damage near the forward fuselage attachment exhibited features of a main rotor blade strike. The tail rotor transmission and the horizontal and vertical stabilizers were attached and secured to the tailboom. The tail rotor blades were separated outboard of the blade root fittings and were not recovered. The main rotor blade spars and skins were wrinkled, bent, and torn. Three of the main rotor blades were separated from the main rotor hub at the pitch housing assemblies, which remained attached to the root end of the blades, and two main rotor blades were remained attached to the hub.

Flight control continuity was confirmed from the cyclic and collective cockpit controls through overload fractures of the control system to the swashplate. Flight control continuity was confirmed from the antitorque pedals through overload fractures of the tailboom control rod to the tail rotor pitch control assembly and tail rotor blades.

The lateral and longitudinal flight control trim actuators were tested using battery power with the actuation of trim control switch. The trim actuators extended and retracted normally. The tail rotor

swashplate bearing and pitch control assembly operated normally when moved by hand. The tail rotor gear box rotated freely when moved by hand; no binding was felt.

Main rotor and tail rotor drive continuity from the engine driveshaft through the main transmission was confirmed. There was no ferrous debris on the main transmission and tail rotor gear box chip detectors.

The engine to main transmission drive shaft was separated at the overrunning clutch flex coupling. The flex coupling bolts and nuts were in place, and the flex coupling plates fractured. The main transmission was rotated by hand through the input drive shaft and the gear train moved smoothly, freely, and without binding. The main rotor head moved with movement of the input drive shaft. A liquid consistent with oil was present in the main transmission oil level sight glass.

Examination of the engine (Rolls Royce M250-C20B, serial number CAE-882569) revealed that it was attached to the engine mounts, and the engine was displaced toward the left due to impact damage, which also damaged the left side compressor discharge tubes and burner can. Engine control continuity from the cockpit controls to the engine power turbine governor (PTG) and fuel control unit (FCU) was confirmed. The FCU indicator was at the ground idle position. Liquid consistent with Jet A was in the fuel line leading to the fuel nozzle. The airframe oil filter did not contain metallic debris. There was no ferrous debris on either of the two engine chip detectors. The first stage compressor blades were undamaged, and the compressor (N1 rotor) turned freely using hand pressure. The gas producer turbine underwent borescope examination, which revealed that the turbine blades were present, intact, and undamaged. The gas producer turbine rotor was continuous to the compressor, which was able to rotate freely using hand pressure. Continuity from the 4th-stage power turbine wheel to the power output shaft was also established.

The top of the goat head consisted of a 1-inch thick horizontal plate to which a bracket mounts that held the shield cable shoe hardware. Examination of the goat head revealed that the shield cable mounting bracket had been sheared off and was not recovered. All four of the attaching 1/2-inch diameter bolts were sheared flush with the face of the plate. One bolt face had red paint transfer. The upper plate exhibited red paint transfer on the face and one side/edge. The paint transfers were consistent in color with that of the helicopter, which was painted red. There was a puncture hole under the upper horizontal plate about 6 inches in length that was consistent in dimensions with that of a main rotor blade.

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