

Examination Notes

During inspection of the helicopter, the helicopter was situated in a hangar, on a stand due to damage sustained to the landing gear. The engine to transmission drive shaft was intact and powertrain continuity was established from the fourth stage turbine wheel to the main rotor. The helicopter was equipped with an inlet particle separator system which was observed damaged, however, no obvious evidence of pre-event blockage was observed.

The engine was found secure with no damage noted to the mounting struts. No external damage was noted on the engine.

A vacuum check was performed on the helicopter fuel system and no leaks were detected. Pressurized air was applied to the pneumatic control system and no leaks were detected when soapy water was applied to the lines and connections. All connections were checked by hand and felt secure. The engine mounted fuel filter element was inspected, and it was free of debris and the filter bowl was full of fuel.

No Foreign Object Damage (FOD) was noted on the compressor or inlet. The magnetic chip detector plugs were clean, and oil wetted with an appropriate amount of oil remaining in the gearbox. The helicopter scavenge oil filter was inspected and no contamination was noted. The oil was normal in appearance and smell, and the filter pending bypass indicator button was not extended.

The helicopter showed no evidence of main rotor blade contact with the tailboom. The Cyclic and Collective both showed control continuity. The anti-torque control system continuity could not be confirmed due to damage sustained to the tailboom and the tail rotor control rod inside of the tailboom.

The throttle twist grip on the left-hand collective control stick was rotated by hand and the throttle lever arm on the fuel control unit moved accordingly. The left-hand collective control stick was raised and lowered by hand and the power turbine governor lever on the power turbine governor moved accordingly.

The main transmissions two magnetic chip detectors that are in the bottom of the main transmission housing were removed, and no ferrous metal particles were observed on either chip detector. Fluid for the transmission was observed through the site glass in the transmission housing.

The main rotor drive shaft showed rotational scoring on the main rotor drive shaft just below the rotating swashplate. The tail rotor drive shaft remained coupled to the main transmission and the tail rotor transmission; however, the tail rotor drive shaft was unable to be rotated due to damage sustained to the tailboom.

The tail rotor transmission remained attached to the aft end of the tailboom and was unremarkable. The chip detector was removed, and no ferrous metal particles were observed on the chip detector.

The helicopter was equipped with a five-bladed, fully-articulated, main rotor system, and a two-bladed tail rotor anti-torque system. Damage to the main rotor system was consistent with damage received when rotating at the time of impact.

The fuel system was examined and noted to be a suction-type system with two interconnected fuel cells that were located beneath the cargo/passenger compartment floor of the helicopter. The helicopter was equipped with a submergible, single stage, centrifugal, constant displacement type start pump that was

mounted in the left-hand fuel cell on the tank sump plate. The system is such, that when the start pump is on, the fuel is drawn in through the pump inlet by suction, when off, fuel is drawn in through a second parallel port, or bypass inlet, by the engine-driven fuel pump.

The remaining fuel that was onboard the helicopter was removed through the fuel tank filler neck by using an external pump. The fuel shutoff valve, located on the fuel cell cover assembly, was found unremarkable. The start pump wire routing was also found unremarkable. Visual inspection of the right-hand fuel cell through the fuel tank filler neck revealed small amounts of a dark-colored substance. No appreciable amount of debris was observed in the left-hand fuel cell. The start pump was removed, and a small piece of fibrous debris was observed on one of the slots in the bypass inlet cover. No debris was observed on the screen filter over the pump inlet. The bypass inlet cover and pump inlet screen filter were removed. During the removal, the circlip and pin that hold the flapper valve in place in the bypass inlet were observed to be missing. The flapper valve was observed wedged against the sidewall of the bypass inlet and appeared to be obstructing about 50% of the discharge port. No other anomalies with the start pump were observed.

The fuel system was examined to locate the circlip and pin. The FAA inspector located the pin in a fuel line that runs between the start pump and the engine-driven fuel pump; the circlip was not found.

No other mechanical malfunctions were noted in the examination of the airframe or engine.