

From: Travis Warthen [mailto:[REDACTED]]
Sent: Monday, April 08, 2013 7:06 PM
To: Scott Arnold; Donald.D.Halbert [REDACTED]
Subject: RE: N392GP

The engine did lose power following the loss of rotor RPM indication, presumably from the rapid lowering of the collective creating a rapid throttle change at high density altitude.

To clarify, the malfunction was the rotor RPM indication, which is provided from a magnet and interrupter mounted on output yoke of the main transmission, not from a magneto on the engine.

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From: "Travis Warthen" [REDACTED]
ASW-ABQ-FSDO-01, Albuquerque, NM
To: Donald D Halbert, [REDACTED]
Date: 04/05/2013 06:09 PM
Subject: RE: N392GP

Here is what we found on N392GP:

The engine was started and it ran normally. The idle mixture was set slightly rich for the elevation here at 3,456 MSL, which is to be expected since the helicopter is based at an airport close to sea level. All other parameters were within normal limits.

We discovered one of the magnets used to provide rotor RPM indications was missing from the transmission yoke. There was scoring on one of the sensor opposite this magnet, indicating it had made contact with the magnet while the yoke was rotating. We talked to Robinson Helicopter Corporation about this, and they indicated that if one of the magnets or sensors opens, the rotor RPM indication will drop and the low rotor RPM warning horn will activate. The magnet was found affixed to a bolt just aft of the yoke and a small dent was found on the horizontal firewall.

We have concluded that this magnet came loose in flight as indicated by the bang heard by the pilots and subsequent low rotor RPM warning horn and loss of indication. The remedial action for low rotor indication is to lower the collective and apply aft cyclic. As the collective is lowered, the correlator rolls the throttle down to help maintain RPM. At nearly 9,500 feet density altitude, rapid throttle changes in the R44 can result in the engine fuel/air ratio becoming too rich or too lean to sustain operation. There are caution and note statements on page 4-10 of the Robinson R44 Flight Manual, indicating that this possibility exists. We feel this rapid throttle change caused the engine to quit and, without enough altitude to attempt a restart, the pilot completed an autorotative landing.

During the touchdown the aircraft rocked forward due to the soft and downward sloping terrain. The pilot applied slight aft cyclic for fear of the main blades contacting the ground and the rotor blades struck the tailcone (caution on 3-1 of RCFM). All the other damage on the aircraft was clearly from after the touchdown and blade contact with tailcone.

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