

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ANC22FA030

ENGINE EXAMINATION

April 19, 2022

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A. ACCIDENT

Location: Gila Bend, AZ
Date: April 15, 2022
Time: 0837

Helicopter: Robinson R-22, N7516G

B. ENGINE EXAMINATION

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Subject Matter Expert Mark Platt
Lycoming Engines

C. SUMMARY

On April 15, 2022 about 0837 mountain standard time (MST) a Robinson R-22 helicopter, registered as N7516G sustained substantial damage resulting from a collision with terrain while operating in the pattern at the Gila Bend Municipal Airport (E63), Gila Bend, Arizona. The student pilot sustained fatal injuries. There was no fire. The Title 14 CFR Part 91 cross country flight originated from the Chandler Municipal Airport (CHD), Chandler, Arizona about 0757 local time. Visual flight conditions prevailed at the time of the accident.

D. DETAILS OF THE EXAMINATION

1.1 Fuel/Fuel System

The fuel supply lines at the engine and firewall were impact damaged and had become displaced at their respective fittings when the engine separated from the

airframe. The carburetor had been liberated from the engine due to impact damage. The mixture cable had been pulled from the end of the arm. The castellated nut and cotter pin remained secure and the serrated interface at the throttle arm remained securely mated.

The carburetor bowl was fragmented. The float pontoon was destroyed. The fuel filter screen remained free of visible contaminants.

The carburetor heat box slide opening was measured at ~2. inches in diameter. The cockpit mounted control knob was unlocked and extended about 1 ½ inches and bent.

2.0 Engine Examination

The left and right magnetos remained securely attached. The ignition harness was secure at each magneto. The magneto to engine timing was observed at (right) 23° & (left) 23° BTDC of the cylinder #1. Each magneto produced spark at the end of the respective spark plug lead, during hand rotation of the drive. The drives of each magneto remained intact and undamaged.

The spark plugs were secure at each position with their respective spark plug lead attached. The spark plugs electrodes remained mechanically undamaged and according to the Champion Spark Plugs "Check-A-Plug" chart AV-27, the spark plug electrodes displayed coloration consistent with normal operation. The static oil soaking of the spark plugs was attributed to the engine positioning at the mishap site and post recovery.

The oil suction screen was destroyed. The full flow oil filter was cut open to expose the filter media. There was no evidence of pre-mishap metal contamination observed at the filter or internal cavities of the engine.

The crankshaft was rotated by hand utilizing the rotor system drive pulley. The crankshaft was free and easy to rotate in both directions. "Thumb" compression was observed in proper order on all four cylinders. The complete valve train was observed to operate in proper order and appeared to be free of any pre-mishap mechanical malfunction. Normal "lift action" was observed at each rocker assembly. Mechanical continuity was established throughout the rotating/reciprocating group, valve train and accessory section during hand rotation of the crankshaft. The combustion chamber of each cylinder was examined through the spark plug holes utilizing a lighted borescope. The combustion chambers remained mechanically undamaged and there was no evidence of foreign object ingestion or detonation. The valves were intact and undamaged. There was no evidence of valve to piston face contact observed. The gas path and combustion signatures observed at the spark plugs and combustion chambers displayed coloration consistent with normal operation.

Submitted by:

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ASI