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Subject: ERA22FA387, Engine Run and Propeller Blade Angle Inspection Results

Contact: Federal Aviation Administration (FAA) Inspector Greg Thurston

As part of the investigation, FAA inspector Greg Thurston of the Minneapolis Flight Standards District Office travelled to South Mississippi Light Aircraft for an inspection and operational testing of the engine. Also present was technical advisor Jordan Paskevich. The inspection and examination took place on December 19, 2022. The engine was run with an exemplar identical propeller as the accident propeller sustained impact damage to all three propeller blades. The propeller blade angle was set to 11.5° as measured at the blade root which correlated to 30° at the blade tip. The engine was placed on a test stand and during an inspection, the flex coupling of the left carburetor was found completely broken¹. The broken flex coupling was replaced and the engine was started and operated to about 4,000 rpm but a leak at one carburetor float bowl was noted². The leak was corrected and the engine was started and operated to 4,800 rpm. The engine was run using only the engine-driven fuel pump. The propeller blades were then pitched to 9.0° and 7.0° the engine was started and operated to 5,100 and 5,500 rpm, respectively.

¹ While on-scene, the same flex coupling was noted to be cracked about 90° circumference at the outboard mounting bolt. Thus, it completely fractured in transit.

² No fuel leakage was noted at either carburetor during the on-scene examination prior to removal of each carburetor bowl. Thus, the leakage was likely caused by the field removal and then installation of the carburetor bowl.

Examination of the propeller was performed by FAA inspector Greg Thurston at the wreckage storage facility. The following results were reported:

Blade #1: 11.7 degrees at root = 30.2 degrees

Blade #2: Marks in blade root indicate blade had rotated in hub to approximately 45 degrees.

Marks in blade root from blade clamp were re-aligned to original position to measure pre-accident blade angle.

11.5 degrees at root = 30 degrees at tip

Blade #3: 11.9 degrees at root = 30.4 degrees