



MEMORANDUM FOR RECORD

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Eastern Region

Date: April 16, 2020
Subject: Information from Wreckage Examination
NTSB Case Number: ERA20LA077

On February 4, 2020, The Wreckage of N78BM was examined at Velocity Incorporated, Sebastian, Florida. The following information was gleaned from the examination.

- Examination of the airplane revealed multiple areas of impact damage that was substantial in nature, including the nose structure, canard, and left aileron.
- Examination of the engine revealed no preimpact anomalies that would have precluded normal operation. There was 100LL fuel in the carburetor float bowl. Testing of the fuel revealed that there was no water present. The spark plugs were in normal worn-out condition, thumb compression and suction were obtained on all 6 cylinders, and there was oil in the sump. Drivetrain continuity was established from the front to the back of the engine, and spark was able to be produced on all sparkplugs.
- Examination of the propeller system disclosed that the airplane had two switches which controlled the propeller. The first switch had two positions (“MANUAL” and “AUTO”); this switch was found in the “MANUAL” position. The second switch also had two positions (“CLIMB” and “CRUISE”); This switch was found in a neutral position.
- The gaps between the three propeller blades were not sealed with silicone and corrosion was present on the propeller slip rings, and supercams. The propeller would not change pitch when the switch lever was operated, though electrical continuity was confirmed from the battery to the carbon brushes in contact with the slip rings.
- The spool also displayed areas of corrosion and that the propeller was not in fine pitch. The planetary gearbox also had very little lubricant present and there were areas that were visibly dry. When rubbed between two fingers, the lubricant that was present was sticky to the touch.

- When power was applied to the leads of the electric motor which moved the propeller pitch mechanism, it would operate intermittently. The electric motor's brushes were also worn to the point that the metal brush housings were contacting the electric motor's commutator. Sometimes the electric motor would operate, and other times it would not, until the output shaft was turned by hand. This indicated the presence of a dead spot on the armature as it appeared to fail "open". Internal examination of the electric motor revealed a broken end on one of the armature coil windings that surrounded one of the three electromagnetic coils.