Memorandum For Record

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NTSB Accident Number: ERA23LA162

Following recovery of the airplane to Atlanta Air Salvage in Griffin, Georgia, examination of the engine was performed by David A. Detscher of the Atlanta Federal Aviation Administration (FAA) Flight Standards District Office on June 26, 2023. As part of the examination and testing of the engine, no spark was noted at any spark plug lead during rotation of the engine using the starter. The single-drive dual magneto was removed from the engine and did not produce spark when the drive shaft was rotated using a pneumatic tool. The magneto and ignition harness were retained for shipping to CAT for operational testing and examination with NTSB Virtual oversight.

The magneto was installed on the test bench with the accident ignition harness as received with test P-leads for testing. The ignition leads were set to jump a 7mm gap. During beginning of operational testing of the magneto the impulse coupling was heard but no spark was noted at any of the ignition leads when the magneto was operated briefly to 1,500 magneto rpm.

The magneto was removed from the test bench and a tester light was installed which determined that neither of the contact assembly were opening with complete rotation of the rotating magnet. Thus, the primary electrical path was shorting to ground. The harness cover with ignition harness was removed and during that process the leads from the left and right capacitor to each contact assembly were tightly installed. Again, during compete rotation of the rotating magnet neither contact assembly would open.

The contact assembly was secured with 2 screws. One was a pivot and the other was an adjustment. The tightening torque check of each is specified to be 21 to 25 inch pounds. Inspection of the left contact assembly revealed it was marked with 7825, which the SME said predated Bendix Service Bulletin (SB) 587, which was dated February 1977. First tightening torque check, and then loosening torque checks were performed of both screws securing each contact assembly using a calibrated torque wrench due calibration 1/12/2024. The following results were noted in the order performed:

Right Adjusting Screw Tightening – moved between 21 and 25 inch pounds

Right Pivot Screw Tightening - moved between 21 and 25 inch pounds
Right Adjusting Screw Loosening - ~ 18 inch pounds
Right Pivot Screw Loosening - ~ 19 inch pounds

Left Pivot Screw Tightening – moved at 24 inch pounds
Left Adjusting Screw Tightening - moved at 24 inch pounds
Left Pivot Screw Loosening - ~ 14 inch pounds
Left Adjusting Screw Loosening - ~ 16 inch pounds

The breaker cam screw which is specified to be torqued to 21 to 25 inch pounds was first checked by tightening and then loosening. The following results were noted:

Tightening – moved at 25 inch pounds
Loosening – moved at 14 inch pounds

The breaker cam was removed from the rotating magnet and during that process it was noted to be tightly secured. Inspection of the cam follower and felt of each contact assembly revealed smearing of the nylon of the cam follower and blackening of the felt. The magneto subject matter expert (SME) reported that the felt starts out white, then with time and use turns brown with oil.[1] Both contact assemblies were removed and the cam follower of both exhibited accelerated wear and heat signatures.

The left and right contact assemblies were disassembled to get dimensions of each cam follower to determine the extent of wear. The SME reported there is no service allowance or any measurement that occurs at overhaul. The following dimensions were noted for each cam follower:

Left –0.0225 inch less than the minimum specification.
Right – 0.0205 inch less than the minimum specification.

[1]The SME reported that at manufacture, the breaker cam is dropped in hot oil then allowed to cool normally to room temperature. That allows oil to be retained in the breaker cam.