

Inspector Statement Keystone Turbine Services - USDA - CAE836941 - Test

2/04/2020 RR 250-C20B engine test at Keystone Turbine

Aircraft: N6186U, OH-6A, S/N 69-16048

Engine: Rolls Royce 250-C20B, S/N CAE-836941

1. Engine uncreated and examined.
2. Engine mounted on Test stand
3. Fuel sample taken, no issues
4. Performed pneumatic pressure test, no issues.
5. Performed a Borescope inspection, inspection revealed damage sustained on several compressor blades Stage 1, noted the most damage to three blades. Damage was noted throughout the 1st to 6th stage compressor blades as, viewed from the borescope camera. Additionally, debris was noted.
6. The Compressor case half was removed for further inspection. The damage revealed from the borescope inspection appeared to be worse than was visually noted.
7. Reinstalled the casing half and the oil filter and fuel filter, no issues noted
8. Engine mounted on the test cell for run test
9. Engine was motored
10. Normal start performed, engine started with no issues.
11. Engine power was stable for 4 minutes then advanced to various power setting. Once the engine reached full power, vibration was noted at the compressor .6ips, which is the high limit, gearbox .3 ips(Limit is .6) and turbine .27 ips.(normal). The engine was allowed to stabilize at takeoff power for 2 minutes. No issues were noted except the vibration level at the compressor was at the high limit the engine was decelerated to idle, then shutdown. During shutdown we observed that the engine started to move up and down. Further inspection revealed the three bolts that attached the bottom engine mount became loose and one of the three bolts was found on the test cell lower oil pan. **NOTE: only the Take-Off Power portion of the test was performed.**
12. The engine was removed from the test cell and the bottom mount inserts were examined. Keystone Turbine stated that this issue has never been experienced and due to the vibration noted from the damaged blades, Keystone Turbine elected not to perform the acceleration and deceleration tests.
13. The Fuel Governor; P/N 2549170-2, S/N HR46616; removed from the engine on 1/08/2020 prior to the accident was tested and found to be functional and within test limits.
14. The Fuel Governor P/N 2549170-2, S/N BR44288; removed from the engine was tested and found to be functional and within test limits.
15. Fuel control unit P/N 2524644, S/N 198732; tested and was found to be within serviceable limits; however, lower reading were noted by the technician during the first section of tests. Reference the test results.

2/5/2020

1. Fuel control unit P/N 2524644, S/N 198732; retested due the technician that performed the test believed that one of the fitting was leaking, which would give lower test results. The technician found that one of the fitting appeared to have a slight leak, the fitting was replaced (Note: the fitting found leaking was from the test unit and not from the fuel control unit). The test results were normal with higher number then yesterday's test. Reference the test results for the second test performed.
2. Fuel Nozzle was removed from the engine and tested, no issues were noted. Reference test results.
3. The fuel pump was disassembled and a small amount of debris was noted in the filter housing, pictures were taken. No other issues were noted during the disassembly of the unit.
4. Fuel pump re-assembled.
5. The Accessory gear housing was removed from the engine and disassembled. No issues were noted.

The group convened in Keystone Turbine Services conference room to review all of the test results and engine run data. The group concluded that we could not determine the cause of the engine power loss, without performing the acceleration and deceleration tests on the engine. Additionally, a possible next step was to exam the aircraft fuel tanks and send a sample of fuel to be analyzed for any type of contamination. All tests reports were given to Mr. Nick Shepler to be distributed to Mr. Ralph Hicks from the NTSB.

Michael D. Bauer

Principal Avionics Inspector