**The Need for a Hot Section Inspection**

**by Eric Rojek**

One of the maintenance items that is frequently discussed is the need for a hot section inspection. While hot section inspection time requirements may differ by engine model, the “mid TBO” recommendation usually applies or when performance loss dictates. For example, on the PT6A-34 engine TBO (Time Between Overhauls) is 4000 hours and hot sections are recommended at 2000 hours. On the PT6A-67B the basic engine TBO is 3500 hours, and the recommended hot section inspection is at 1750 hours. If you find that you are at or over these times and need to get a hot section done, Pratt & Whitney Canada does allow 50 flight hours or 30 days for maintenance scheduling. All this information exists for all engine models in various service bulletins. In addition, the hot section criteria is defined in the engine maintenance manual

What exactly is a hot section inspection? The hot section inspection is the way of making sure the condition of some of the hardest working parts in your engine are capable to continue to do the job. The PT6 engine is all about efficiency and the hot section inspection is a simple and fast inspection to confirm the engine is not losing efficiency. The hot section area of the engine is one that a wide variety of factors can change efficiency just through normal operation. Fretting, wear, cracking and rubbing all have a chance to exist in the hot section and all can negatively affect your engine’s efficiency and performance.

When the engine is split to perform the hot section inspection, one of the first tasks is to measure the compressor turbine blade tip clearance. Tip clearance is one of the key areas for efficiency. On a PT6A-34 the median tip clearance is .013”. That is the thickness of a couple of business cards. That is awfully close for a disk that spins thousands of revolutions per minute. Next the turbine disk is removed and the rest of the hot section parts are checked for deterioration, distress, or other problems. After repairing any issues that are found, the components are resurfaced and resealed as needed. The compressor turbine blades tips clearances are reset as needed to get maximum efficiency. Then the hot sections is put back together.

There are additional requirements in a hot section inspection. Bleed valve and compressor condition must be checked. The gas generator case has an inspection criteria. The fuel nozzles, the power turbine stator and housing, exhaust duct, oil strainers, oil filters and chip detectors are also checked. No one wants to invest time and money into a hot section inspection and then find out the compressor has issues and the engine must be removed. Or one finds out that the gearbox is making metal. All the parts checked to inspection criteria are important when it comes to hot section inspection.

Please reach out to me at ericr@covingtonaircraft.com if you have any questions and I’ll be glad to assist.