

Hicks Ralph

From: [REDACTED] Routh [REDACTED]
Sent: Monday, June 27, 2016 3:22 PM
To: Hicks Ralph
Cc: Wentz Peter
Subject: RE: Wreckage Exam at Anglin's (P-47D, N1345B, NYC) ERA16LA195

Ralph,

I spoke with Dennis Diaz on Wednesday morning, June 22 regarding the status of the engine teardown/examination. I reported that due to what must be extensive damage in the Crankcase Section I was unable to remove a cylinder to look inside. This is actually a common phenomenon that occurs when something breaks free and bangs around inside the gearbox of a radial engine while the engine is still rotating. The term I've heard used is "something making the grand tour". The cylinder skirts protrude down into the crankcase and when they get damaged or bell-mouthed they don't want to come out and it usually affects all the cylinders. An overhaul shop was contacted to see if they had any ideas for removing a cylinder in the field with this type of damage and they suggested trying to pull a cylinder out with a lift. Anglin personnel put a boom attachment on one of their lift vehicles and we attempted to pull a cylinder out with a strap. The entire airplane started to slide, but the cylinder did not budge. I was able to get good information on the severity of the damage from the Blower Section. This section, which is normally clean and dry, was soaked in oil and full of metal debris. The intake manifolds that I removed were also soaked in oil and full of metal particles. This means the cylinders were being fed metal while the engine was still running which would have expedited the failure.

So the Facts are as Follows:

- Cylinder removal could not be accomplished
- Heavy presence of oil and metal contamination in Blower Section
- Heavy presence of oil and metal contamination in 4 Intake Manifold sections inspected.
- #18 Cylinder Head failure
- Engine drive train is locked

Indications/Theories:

- Blower Section most likely failed which sent metal into cylinders. Also, Blower Section failure could possibly result in loss of oil pressure to major sections of the engine which would expedite total failure.
- Damage in Crankcase must be severe to lock engine and prohibit cylinder removal. Crankcase section could have been initial failure point which in turn caused Blower Section failure, however blower section failures are more common.
- #18 Cylinder failure is probably the result of the damage in the crankcase, not the point of origin.

An extensive engine teardown is the only way a more accurate engine failure cause could be determined. I believe this type of inspection could only reasonably be accomplished at a facility with the tools and experience to overhaul this particular engine. Further disassembly of this magnitude would be extremely difficult and time consuming at Anglin's facility with the tools available on hand.

Please let me know if I can be of any further assistance.

Regards

Stanley J. Routh
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