

Field Notes

Case: ERA09LA481

Date: 10/22/2009

Time: 0800 EDT

Location: Certified Engine Unlimited, Inc

4000 N.W. 145 Street –Airport

Opa-Locka, FL. 33054

Present: NTSB IIC

Certified Engine Unlimited Mechanic (1 ea.)

Components Tested: Engine Lycoming, Model: O-360-F1A6, S/N: L-34417-36A

No external damage to the engine was noted.

Observations/ Work

- Removed oil sump pan
- Found #3 cylinder piston rod separated from crankshaft
- Oil sump pan: observed a lot of metal, broken piston rod bolt, metal pieces, chunks, flakes, etc.
- Removed back accessory case housing with compound still attached: unremarkable
- Oil pump rotates freely
- Oil pressure regulator valve: unremarkable, ball and spring okay
- Removed cylinder spark plug: unremarkable, normal wear
- Push rod and rocker unremarkable
- Lifter: unremarkable
- All cylinder base nuts torqued with torque strip marking
 - o Note: #3 cylinder top aft thru bolt nut was loose
- #3 piston rod crankshaft bearing missing and indication of overheat and oil starvation
- Crankshaft oil passage journal clean and air flow checked
- All crank case oil passage journal clean and air flow checked
- All main crankshaft bearings unremarkable
- Disassembled oil pump: unremarkable and correct Airworthiness Directive applied
- Cylinder walls and piston rings unremarkable and normal wear indication
- Main bearing case unremarkable
- Internal case damage consistent with several rotations of the crankshaft before locking up
- Lifter pads broken and separate (5 of 8)
- Left casing top on aft lifter external damage from broken lift pad

- All cylinder walls and piston rings unremarkable and display normal wear
- #3 and #4 piston rod arm observed with overheat signature
- #3 piston rod bearing destroyed, bolt separated (overload) and rod bent, lower section destroyed
- #4 piston rod bearing initial indications of failing, oil starvation, and overheat
- Piston rod and bearing #2 and #1 unremarkable
- Crankshaft #3 and #4 piston attaching points consistent with exposure to overheating
- #3 position on crankshaft consistent with extreme heat buildup
- Sump-oil quick disconnect function normal
- Oil sump: pick up screen full of metal and copper pieces, 30% blocked
- Oil filter full of copper dust particles: consistent with long term collection
- Cam bent in front of aft cam, impact mark
- Oil filter house bypass, thermal regulator and journal check good
- Mechanical fuel pump: no engine oil bypass, unremarkable
- Pressure check oil cool and oil lines unremarkable; had oil in the component

Summary: The #3 and #4 piston rods were observed with signs of oil starvation and overheating, leading to the destruction of portions of the #3 piston rod. The engine's oil system was unremarkable. The reason(s) for the engine oil supply depletion could not be determined.

Jose Obregon, NTSB IIC.