01/07/2015: INSPECTED AIRCRAFT ON SITE, PRELIMINARY DAMAGE ASSESSMENT QUALIFIES INCIDENT AS AN ACCIDENT. PHOTO DOCUMENTED DAMAGE, TURNED OFF ELT (AIRCRAFT OWNER).

01/13/2015: INSPECTED AIRCRAFT AT PVG, FOR THE PURPOSE OF DETERMINING IF ENGINE PERFORMANCE HAD BEEN A FACTOR IN THE ACCIDENT. UNCOWLED ENGINE, AND WITH THE EXCEPTION OF ONE BENT PROPELLER BLADE (FROM THE WEIGHT OF THE AIRCRAFT PUSHING IT INTO THE MUD), A SMASHED SPINNER AND THE AIR INTAKE AND FILTER BEING PACKED WITH MUD, THE ENGINE APPEARED PRETTY MUCH UNDAMAGED. THE TWO AFT RIGHT ENGINE MOUNT TUBES WERE BUCKLED, AND ONE BROKEN, BOTH AS A RESULT OF THE ACCIDENT FORCES. THE ENGINE TURNED OVER BY HAND SMOOTHLY, AND WITH VERY GOOD COMPRESSION ON ALL 4 CYLINDERS. ALL 8 SPARK PLUGS WERE REMOVED, AND WITH THE EXCEPTION OF #2 BOTTOM BEING OIL FOULED (FROM THE AIRCRAFT RESTING NOSE DOWN WITH A SLIGHT LIST TO THE LEFT), ALL OTHER PLUGS WERE MILD TAN TO A SLIGHT OVERRICH SOOT. ALL IGNITION LEADS PRODUCED A SRONG SPARK, WITH THE EXCEPTION OF #2 BOTTOM. THE LEAD HAD CONTINUITY AND WAS NOT GROUNDING OUT. THE MAG DIRTRIBUTOR CAP WAS REMOVED, AND THE LEAD SOCKET EXAMINED. THE INEER CONTACT SURFACE WAS CLEAN AND SHINY, BUT THE LIP OF THE SOCKET HAD SOME CARBON TRACES THAT MIGHT BE GROUNDING OUT THE SPARK. THE CARBON TRACES WERE CLEANED, ANDT HE CAP REINSTALLED. (NOTE: THE PILOT REPORTED A NORMAL MAG DROP BEFORE TAKEOFF, IF THE #2 BOTTOM PLUG HAD NOT BEEN FIRING HE WOULD HAVE EXPERIENCE A VERY LARGE RPM DROP, SINCE ONE CYLINDER WOULD CEASE FIRING ALLTOGETHER. AS IT BECAME OBVIOUS LATER DURING THE ENGINE RUN, THIS WAS NOT A FACTOR, BECAUSE IT RAN FINE, WITH ALL PLUGS FIRING, AND A GOOD MAG DROP. I CAN NOT EXPLAIN WHY THE #2 BOTTOM LEAD WOULD NOT PRODUCE A SPARK WHILE PULLING THE PROP THROUGH BY HAND, BUT I DO NOT BELIEVE IT HAD ANY EFFECT ON THE ACTUAL ENGINE PERFORMANCE). THE ENGINE WAS THOUROUGHLY CLEANED WITH COMPRESSED AIR, AND THE PROP REPLACED WITH A SERVICEABLE REPLACEMENT. THREE GALLONS OF FUEL WERE PLACED IN THE RIGHT TANK (THE LEFT WAS COMPROMISED), AND THE ELECTRIC FUEL PUMP RUN TO PRESSURIZE THE SYTEM AND CHECK FOR LEAKS, NONE FOUND. THE FUEL CONTROL RIGGING (THROTTLE AND MIXTURE) WAS CHECKED, FOUND OK (BOTH MAX AND MIN STOPS BEING HIT WITH NORMAL EFFORT FROM THE COCKPIT CONTROLS). THE AIRCRAFT WAS PLACED OUTSIDE AND SECURED, AND EVEN THOUGH IT WAS COLD SOAKED, AND THE TEMPERATURE WAS ABOUT 30F, A SUCCESSFUL START WAS OBTAINED WITH LESS THAN ONE PROP REVOLUTION, AND THE ENGINE SETTLED AT A NICE EVEN IDLE OF ABOUT 900 RPM, TO ALLOW IT TO WARM UP A BIT. ALL ENGINE PARAMETERS WERE NORMAL, AND ONCE THE OIL TEMP CAME OFF THE BOTTOM (WE COULD NEVER GET IT UP TO THE GREEN ARC, SINCE THE ENGINE MOUNTS WERE COMPROMISED, WE NEVER WENT OVER 1200 RPM), WE CHECKED THE PARAMETERS OF AD-2001-06-17, AND THE ENGINE SETTLED AT AN EVEN 600 RPM IDLE, WITH A 10 TO 20 RPM RISE AS THE MIXTURE VERNIER WAS SLOWLY SCREWED OUT. THE MAG DROP CHECK WAS PERFORMED AT 1200 RPM (AGAIN, THE MAX RPM WE DARED GO TO, DUE TO THE COMPROMISED ENGINE MOUNTS), WITH ABOUT A 50 RPM DROP FOR EITHER MAG. THE ENGINE WAS THEN SHUT DOWN NORMALLY WITH THE MIXTURE CONTROL, AND AGAIN RESTARTED WITH NO PROBLEMS SOON THEREAFTER, AT THE SUGGESTION OF A SENIOR MECHANIC WHO WAS ASSISTING, FOR THE PURPOSE OF VERIFYING IF FOR SOME REASON HAVING THE ELECTRIC FUEL PUMP ON OR OFF WOULD AFFECT THE ENGINE OPERATION, AND IT DID NOT. THE MAINTENANCE RECORDS WERE REVIEWED, ALL WERE IN ORDER AND CURRENT. THERE WERE NO RECORDS OF ANY MAINTENANCE ACTIONS PERTAINING TO THE ADJUSTMENT OF IDLE RPM (OR ANY OTHER FUEL CONTROL ADJUSTMENTS) SINCE THE CURRENT ENGINE WAS INSTALLED, AND THERE WERE NO RECORDED PILOT DISCREPANCIES PERTAINING TO ENGINE IDLE ISSUES, OR ANY OTHER ENGINE PERFORMANCE ISSUES, GOING BACK 2 AND HALF YEARS. INTERVIEWED THE TWO MECHANICS INVOLVED IN THE MAINTENANCE OF THE AIRCRAFT SINCE MAY 2012, FOR THE CURRENT OPERATOR, AND NEITHER REPORTED ANY ENGINE PERFORMANCE ISSUES. IN CONCLUSION, I HAVE BEEN UNABLE TO IDENTIFY ANY MECHANICALS FACTORS THAT MIGHT HAVE CAUSED THIS ENGINE TO NOT PERFORM AS DESIGNED.