

FAA Inspector Report – Mr. Wesley Dollahite, Denver FSDO

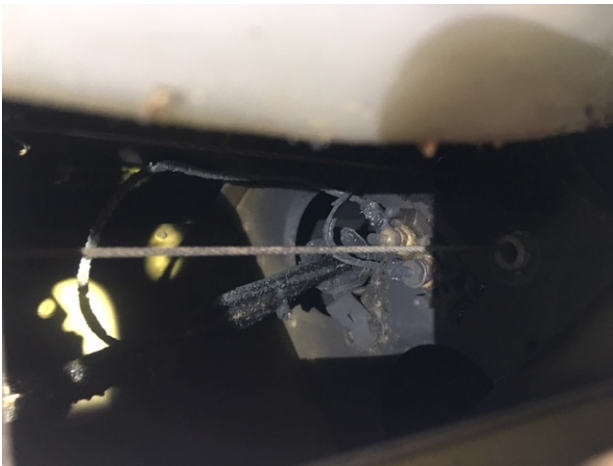
On Friday July 12, 2019 I drove from Denver to Sidney, Ne, to help with an accident involving Queen Air, N62069, S/N 62-3866 that during departure had a left hand wing explosion. Met with a team from Bemidji Aviation including the Director of Maintenance and Director of Ops, as I walked into the FBO they taxied onto the ramp.



We were led to a hanger on the airport that held several aircraft including the Queen air. It had been defueled by a mechanic from Bemidji a couple days before so no fuel leaks were present. DOM preceded to open up all wing panels so that we could have a good visual inspection. During this visual heavy fire damage was seen in the wing root area, including sooting from several areas, burned wiring, melted insulation and a couple areas of burned paint on the outside of the wing.



As the inspection happened the discussion arose about what the pilot had stated after returning to the ramp. This is when the statement of the erroneous stall warning activation started to point us at a grounding of the wiring and possible arcing that would have caused the ignition of the fuel. We then started tracing wiring as much as possible and found an area where two clamps were clamped to a rib for the wing wiring to run through. Power was hooked back up and the stall warning continued to sound and the Nav light circuit breaker was popped and could not be reset. This aircraft is not equipped with wingtip strobes so no wiring was present for the packs. Not being able to see what was going on with the wiring clearly we decided to move the aircraft outside and prepare the aircraft for fueling.



Aircraft was moved outside of the storage hanger and the DOM preceded to add fuel back into the fuel tank that we determined might have caused the leak. Discussion arose that the inboard fuel probe had been changed during recent maintenance which raised some suspicion. Looking at the screws for the probe the safety wire was loose and sloppy, area around probe showed both fuel staining and soot from the fire. Fuel was added to the wing tanks, at about the 15-25 gallon range the fuel probe hold down screws started leak profusely to the point where fuel was dripping into the wing. Safety wire was cut and a screwdriver was put on each hold down screw, each one turned between  $\frac{3}{4}$  to  $1\frac{1}{2}$  turns shutting off the fuel leak. The rest of the wing was inspected for fuel leaks, no other leakage was noted at this time. Interesting find was noted that a rubber vent line was found behind a stringer in the wing, this line showed burning at both ends but could not be determined if it had been connected before the fire.

It was decided to cut a hole into the wing skin near the area where the wiring appeared to be pinched, DOM retrieved a hammer chisel and a pair of shears. Hole was cut and the

wing wiring harness was able to be seen more readily. Harness was found to be pinched between a clamp and a wing rib. Harness was moved outward from the clamp and shiny metal to metal contact areas were seen. This seemed to be the area where the inboard fire started. Wiring harness insulation was heavily damaged so there was no easy way to separate the wiring to see if the stall warning would stop sounding.



In this area were two clamps, wiring can be seen passing thru one clamp, other clamp was missed by wiring and pinched against the rib. This is also the area where the paint was bubbled and burned on top of the wing.

Interesting note, Asked the DOM what the company had done to inspect the wing before attached, his stated that they had not any inspection to the wing since it was bought from the school in Denver. Several other rubber vent lines had been changed and possible fuel bladder changes but the wiring in the wing had never been inspected. In fact a vent found in the wing was capped by a red plastic plug during our look thru the wing.

So between the fuel leaking from the sending unit and the wiring being pinched and arcing the cheese seemed to line up. Flames from the inboard fire ignited the vapors in the wing causing the wing tip to explode.



