

I participated in the examination of the wreckage of the Fisher Celebrity N228LC at the AMF hangar facility in Springfield TN. Also present were Mr. Arnold Scott of the NTSB and a representative from the FAA.

Mr. Scott had the opportunity to examine the crash site and stated that the aircraft fuselage and left wings were found together with the wings folded back against the crumpled fuselage consistent with damage due to the ground impact. The right wings were separated from the fuselage and each other and pieces of these were found distributed over a corn field. Recovery of the right wings was hampered by the height and density of the corn. A drone was utilized to look for smaller pieces of wreckage.

The pilot was an employee of the Federal Aviation Administration in the Cincinnati FSDO office. I believe he was also a DAR for amateur-built aircraft. He had owned N228LC for about a month.

Initial inspection of the wreckage indicated a well-constructed amateur-built aircraft. The construction followed the plans to the extent of my comparison. The glue joints had adequate glue and the spars showed the use of correct materials and construction technique.

The first failed components that were of interest and generated a lot of discussion were the lower right wing spar brackets (3). All failed in a similar manner as shown in Images 1-3.



Image 1: Front Attach Bracket – Lower Right Wing Main Spar



Image 2: Rear Attach Bracket – Lower Right Wing Main Spar

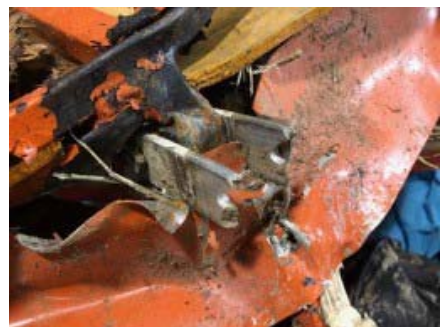


Image 3: Inboard Both Attach Brackets – Lower Right Wing Main Spar

These are all shown in the upright position. The failure of the bracket indicates that the top portion failed in tension and the bottom portion below the attach bolt failed in compression indicating that the wing was experiencing a negative load in excess of its ultimate strength limits. The other four wings failed across the wooden spar consistent with being torn away from the aircraft due to an impact load - presumably from contacting the ground or near-ground obstacles. Image 4 shows one of the other main spar failures representative of them all. It is my opinion that the initial structural failure was in the brackets shown above.

Another failure that was notable was in the threaded portion of the upper rod end on the left aileron connecting rod. It appeared to have internal corrosion that may have been antecedent to the accident and also may have contributed to the cause of the accident. This component has been sent to the laboratory for analysis to determine if there was corrosion in this component that could have caused its failure in flight. Images 5 & 6 show the severed threaded portion of the rod end with the set and jam

nuts still in place. Failure occurred just above the set nut. Another question for the lab to answer is the composition of the threaded portion and the composition of the nuts – could the nuts have caused some galvanic corrosion due to incompatible materials. Were the nuts and the rod end both AN hardware?



Image 4: Main Spar Severed Just Outboard of the Attach Bracket



Image 5: End View Severed Rod End



Image 6: Side View – Severed Rod End

I have two theories to explain the visible evidence.

Theory #1:

The right wing spar attachment brackets failed under a negative load that exceeded the ultimate strength of the wing structure. The cause of that failure is speculative. The failed rod end appears from visible examination to have been corroded internally. If that rod end failed in flight, the rod itself would have torqued the lower aileron downward. It is plausible that the pilot exceeded the g load limits of the airframe while struggling to gain control of the aircraft. The right wing attach brackets failed and then the wing separated from the aircraft. The evidence shows that the left wings folded back against the fuselage on impact. In this scenario, the cause of the accident is the failed rod end.

Theory #2:

The pilot was reported to be very conservative and not interested in aerobatics. It is possible that he became incapacitated and lost control of the aircraft. The failure of the right wing attach brackets without similar stress on the left would indicate a severely abnormal aircraft attitude normally only seen in extreme aerobatics – not so called “gentleman aerobatics”. The critical structure of the aircraft was to plans and it was built by the original designer. There was no evidence of substandard components or degradation except for the aforementioned rod end. In this scenario the rod end was an ancillary failure.

I don't think the evidence is conclusive for either of these theories and I am open to others as well. It would be helpful to have autopsy results for the pilot. Laboratory results for the failed metal parts will provide further pieces of the puzzle.