

B-17 AIRWORTHINESS DIRECTIVE

WHAT DOES IT MEAN AND HOW WILL IT IMPACT THE SURVIVING B-17 FLYING FORTRESSES?
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The much anticipated, overly speculated upon, FAA Airworthiness Directive (AD) for the B-17 wing attach structure was published on Wednesday, 17 May 2023, to become effective on 1 June. The published AD will effectively ground the three US-based B-17s until required inspections and, possibly, repairs are completed. It will most likely ground the UK-based B-17 also in the near future given the severity of the structural issue and the normal close cooperation between the FAA and the UK Civil Aviation Authority (see this issue's "Warbird & Classic Report").

To immediately quell the rampant speculation on the web, this new AD does not:

- Permanently ground all B-17s

- Require the spars to be replaced (yet)
- Affect the carry-through wing structure in the fuselage

The AD does answer most of the questions that have arisen in the past two years and, more specifically, the past few weeks, about the wing spars and attach points. As a recap, the EAA B-17G (44-85740, N5017N), otherwise known as *Aluminum Overcast*, was grounded by the EAA in April 2021 when a pre-flight inspection revealed an anomaly in the left wing attach structure at the fuselage. And last month, on 15 May, the Yankee Air Museum voluntarily grounded its own B-17G (44-85829, N3193G), otherwise known as *Yankee Lady*, based on the expectation of an Emergency Airworthiness Directive (EAD) being issued.

Also as a recap, the primary structure

of the B-17 inner wing panel consists of two truss-type wing spars, forward and rear. Each truss-type spar is built up from two spar chords, upper and lower, that are assembled with tubular members forming "N" type trusses. The upper and lower spars, both front and rear, are themselves attached to the fuselage center section with steel terminal fittings that are bolted into the inner end of the spar chords. Eight close-tolerance bolts fix the terminal fitting into the spar chord. Then, the terminal fittings attach to matching wing attach fittings on the fuselage center section that sandwich the wing fittings. The two parts are secured with special tapered pins. Thus, there are four main attach points that hold each wing to the fuselage, along with two other specialized secondary attach points located between the upper and lower spars. The secondary attach points are where the sheer terminal is

located and are held with a single bolt. Over the past two years, the EAA has related in several information releases that the problem found in April 2021 that grounded *Aluminum Overcast* was found in the left rear shear attachment

that there remained two other points of attachment for the forward wing spar, the upper terminal fitting and secondary single-bolt shear attachment. In any event, the fact that the wing shifted two inches at that attach points indicates a significant structural failure; fortunately, a well-done pre-flight inspection revealed the problem and the proactive EAA immediately grounded the airplane where it was, at Punta Gorda, Florida.

point. Based on the just-released AD, that was not, in fact, the case.

Further inspection of *Aluminum Overcast* by the EAA revealed that the identical lower forward terminal fitting to spar chord on the right wing had suffered cracking. Since April 2021, *Aluminum Overcast* had its wings removed for inspection and repair, suffered some tornado damage, and was ultimately trucked overland to Oshkosh, Wisconsin, where it currently sits in an EAA hangar being repaired.

So, what of this new published AD? Well, it really is addressing the same