

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR25FA020

AIRFRAME AND ENGINE EXAM

August 12, 2025

A. ACCIDENT

Location: Las Cruces, New Mexico
Date: October 20, 2024
Time: 0224 MDT
2024 UTC
Airplane: Extra Flugzeugbau GmbH EA 300/L, N512DW

B. AIRFRAME AND ENGINE EXAM

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C. SUMMARY



Figure 1 Airframe and engine exam

Flight control continuity was established from the cockpit flight controls to the respective flight control surfaces. All areas of separation within the flight control cables were consistent with overload or separation by recovery personnel to facilitate removal from the accident site. There were no anomalies with the engine that precluded normal operation.

1.0 Airframe Examination

Make: Extra Flugzeugbau GmbH
Model: EA 300/L
Serial Number: 019

RUDDER

The rudder remained connected to the vertical stabilizer by all three hinges and could be moved side to side freely from stop to stop. The vertical stabilizer appeared undamaged. The tail wheel assembly was intact and connected to the rudder assembly, and the rudder cables were attached to the rudder horn. The

cables were continuous to the aft cabin, where they had been cut by the recovery crew. From there, the rudder pedals were connected via their respective cables.



Figure 2 Forward and aft control stick

ELEVATORS

The horizontal stabilizer remained attached to the aft fuselage and had rotated slightly to the right such that the rudder was impinging on the right elevator. The fabric covering on the left side was removed, and there was no evidence of foreign objects or control binding.

The trim tab control cabling was cut by recovery. The trim tab was found separated from its hinges from the right elevator but remained attached by the control cable with no sign of flapping damage against the side of the vertical stabilizer.

The mass balance remained attached to the elevator control arm. The push-pull tubes forward to the control stick had separated in multiple locations, all separation surfaces exhibited bending and twisting damage consistent with overload. The control sticks remained attached at their bases (figure 2).

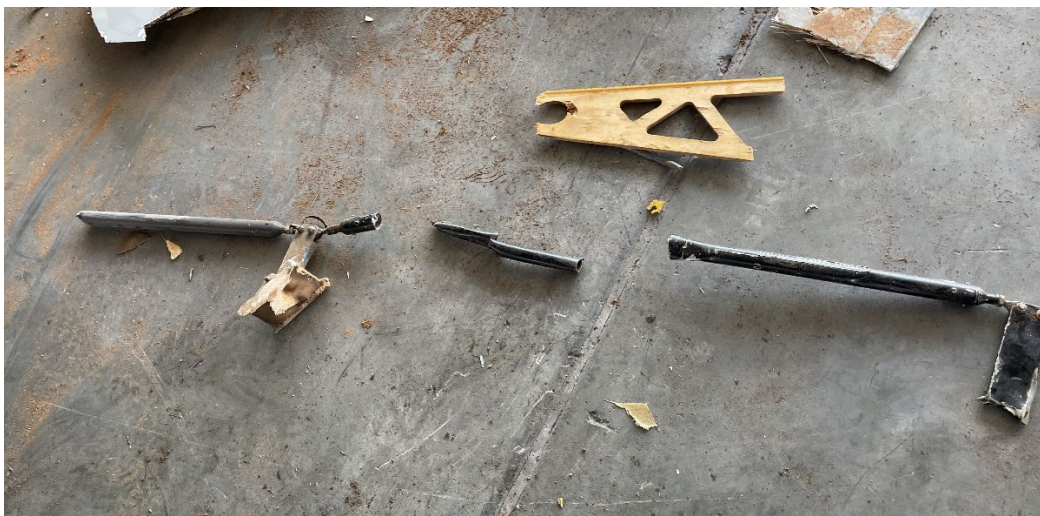


Figure 3 View of left aileron interconnect tube assembly



Figure 4 View of middle aileron interconnect tube assembly

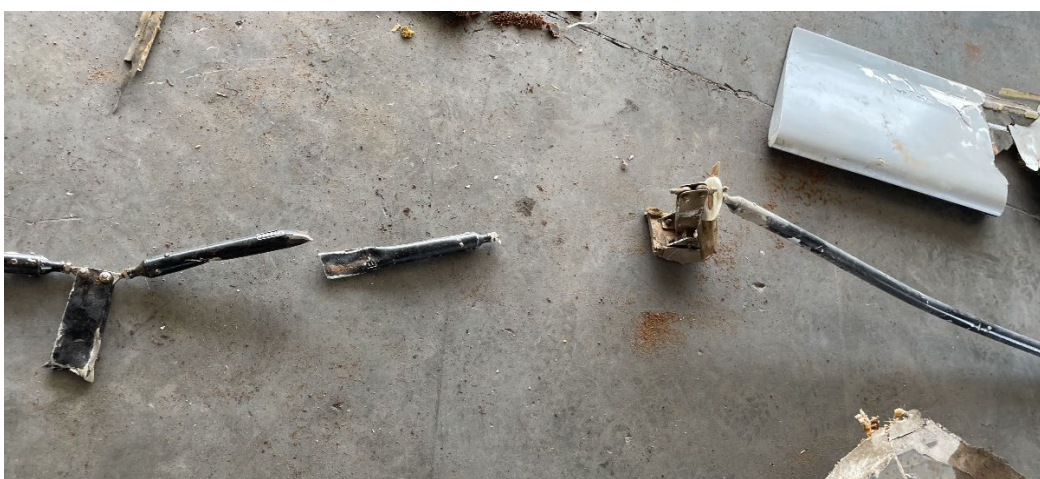


Figure 5 View of right aileron interconnect tube assembly

AILERONS

The control stick interconnect tube assembly had separated about 9 inches forward of the aft stick (figure 2). The aileron control arm had broken away from the outer tube of the assembly. At the failure point, the weld remained intact, and the arm had torn away in a manner consistent with overload. The aileron interconnect assembly had broken into multiple sections, with all failure features exhibiting bending damage consistent with overload (figures 3, 4, and 5). The wing push-pull tubes on both sides had separated in multiple locations, with similar bending and tear damage as observed in the elevator control system. The left aileron remained attached to the wing. The right wing and aileron had fragmented into multiple pieces. Both the left and right aileron spades remained attached to their respective control surfaces.



Figure 6 View of canopy layout

1.1 Cockpit

The canopy (figure 6) and airframe opening had fragmented into multiple pieces. All of the primary components were located. All three canopy hinges remained attached to the canopy frame. The canopy lock shaft had bent about its span, but the aft pin appeared to be in the locked position.

The forward (passenger) and aft (pilot) instrument panels were heavily fragmented. The pilot's altimeter was missing from the panel, and only small remnants were located in the debris; as such an accurate assessment of the Kollsman window setting could not be made.

1.2 Fuel/Fuel System

A visual inspection was conducted of the fuel system. Low air pressure air was attached to the center fuel outlet of the selector valve, and air passed through the valve to the inlets. The fuel lines within the cabin, coming from the tanks, were impact damaged and their integrity could not be confirmed. The electric boost pump was attached to a power source and made a sound consistent with operation. The fuel supply line from the fuel selector to the fire wall was fracture-separated and could not be tested.

The throttle and mixture control cables were found in their full forward positions on the firewall but separated beyond the firewall in a manner consistent with impact damage.

2.0 Engine Examination



Figure 7 View of engine exam

Engine Manufacturer: Lycoming
Engine Model Number: AEIO-540-L1B5
Engine Serial Number: L-25724-28A

Examination of the engine revealed that it was still attached to the engine mounts, which had been cut by recovery personnel (figure 7). All six cylinder assemblies remained attached to the crankcase and the pushrods all exhibited bending damage consistent with impact. Opposite the number three exhaust valve cam lobe was an inward punched hole on the crankcase. The oil sump was completely shattered. There was a large opening on the left forward side of the crankcase, and the forward crankshaft flange appeared to have been bent to the right.

All of the intake manifold tubes were crushed and detached, similarly the exhaust tubes and muffler were detached. The inner surfaces of the exhaust tubes exhibited tan and brown deposits with no oil deposits. The engine accessories including the right magneto, alternator, and starter motor had fragmented. The left magneto was firmly in place and sparks were observed in firing order at the output leads when the input shaft was rotated by a drill.

The engine driven fuel pump was impact damaged, but its vanes were intact and the input shaft could be rotated by hand, with corresponding movement of its vanes. The fuel flow divider was disassembled, and its diaphragm was pliable and free of cracks and holes. The fuel servo inlet screen was clear of debris. The servo plug had a 'G' stamped in it meaning FAA Airworthiness Directive 2009-02-03 had been applied. Both internal diaphragms were pliable and free of tears.

The rocker box covers were removed. The intake and exhaust rocker arms and associated springs were intact, and all oil coated. The upper spark plugs were removed, and all six cylinders were examined internally using a lighted borescope. A light tan and brown combustion deposits were observed within the combustion dome of each cylinder and piston face. All the intake and exhaust valves were unremarkable. Due to the forward bend in the crankshaft, the drive train would not rotate.



Figure 8 Removed top spark plugs.

The spark plugs were the massive electrode type, and all exhibited black and gray deposits within the electrode area (figure 8). The spark plugs exhibited signatures consistent with WORN OUT - NORMAL when compared to the Champion Check-A-Plug comparison chart.

3.0 Propeller Examination

Propeller: MT-Propeller
Model: MTV-9-B-C
Serial Number: 190686

The propeller governor input shaft could be rotated. The propeller blades had all sheared off the propeller hub. All the propeller blades were fragmented and found within the immediate vicinity of the impact crater, as such damage appears to be as a result of impact damage.

Submitted by:

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