

# National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24FA053

## **AIRFRAME AND ENGINE EXAMINATION REPORT**

December 9, 2023

## **A. ACCIDENT**

Location: Eloy, Arizona  
Date: December 8, 2023  
Time: 1329 Local  
Airplane: N66180, Kitfox Series 5

## **B. AIRFRAME AND ENGINE EXAMINATION REPORT**

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## **C. SUMMARY**

The examination was performed at the accident site on December 9, 2023. The steel members of the airframe sustained extensive crush and fragmentation damage, with the remaining components largely consumed by fire. The flight control system sustained thermal and impact damage, however all examined failure points exhibited bending damage consistent with overload at impact. No mechanical anomalies were noted to the engine or airframe. A propeller blade, iPad, exhaust pipe section, flight manual, and fragments of clear plexiglass were located and distributed between ¼ and ½ mile north of the accident site, generally below the airplanes ADS-B depicted flight path.

## **D. DETAILS OF THE EXAMINATION**

### **1.0 Accident Site**

The airplane came to rest in Tumble Weed Park, a dirt field, 1.2 miles southwest of the departure end of runway 20, of Eloy Airport. The entire structure was consumed by fire, with only steel airframe and burnt aluminum, composite, and flight instrument remnants remaining.

The first identified point of impact was an almost complete impression in the dirt of the airplanes front profile, including both main landing gear, wheels, the wings, and lift struts. (Figure 1). The engine had detached and was in the center of the impression. About 20 feet beyond, both wings had come to rest in line with the impact point. Next in the debris field was the cabin and tail structure which was

crushed aft, such that the foot pedals were comingled with the remnants of the empennage (Figure 2).

## **2.0 Airframe Examination**

The empennage remained largely intact and had detached from the twisted and fragmented tail stringers, and was facing in the opposite direction of the airframe and wing structure. The rudder was intact and remained attached to the vertical stabilizer by its upper and lower hinges. The rudder cables were continuous from the control arm through to the foot pedal assemblies.

The moving horizontal stabilizer remained partially attached to the empennage by the lift struts and pitch trim servo. The horizontal stabilizer aft mount had broken away from the empennage frame. The elevator remained attached by its hinges. The elevator control horn had pulled away from the elevator torque tube. The elevator push pull tubes had melted throughout the tail section and lower fuselage structure, however the rod ends remained attached to the idler bellcrank and cabin control column assembly.

Both wings remained in their respective positions with reference to the airframe. The main wing spar was continuous between both wings. The left lift struts were still connected to the fuselage fittings and the left wing spars. The right struts were connected at the fuselage fittings and the forward spar but had detached from the aft spar.

The flaperons remained in place adjacent to the wing trailing edges, but their hinges had melted away from the aft spar. The flaperon control arms remained connected to the bellcrank mixing assembly via each push-pull tube. The mixing assembly was crushed and fragmented and its controls to both the flap control lever, and aileron bellcrank had broken away. The control column assembly was largely intact, and the tops half of each control stick had detached and melted.

The landing gear strut had detached from the airframe and was located about 150 ft downrange. Both wheels had separated from the gear strut and were located within the immediate vicinity of the wreckage. The tailwheel assembly was largely undamaged and remained attached to the empennage section.

## **3.0 Engine Examination**

The engine data tag could not be identified, and the engine upper crankcase data pad markings appeared to have been removed. According to a friend of the pilot, the engine was originally a Lycoming O-290 that had been upgraded to an O-320 by replacement of the pistons and cylinders.

The engine sustained extensive impact damage and remained attached to the engine mount by its upper mounting lugs (Figure 3). The lower lugs remained attached to the mount but had broken away from the crankcase. The oil sump was fragmented, exposing the lower crank area. The crankcase was intact, with no evidence of perforation or internal component expulsion or catastrophic internal failure. The accessory case had been breached, exposing the accessory gears, which were intact, and coated in oil. The engine appeared to be equipped with two "E-Mags" both of which remained attached to their pads.

One spark plug from each cylinder was removed. They were all automotive types and exhibited dark grey coloration to their electrodes (Figure 4). The cylinders were examined with a borescope through the spark plug bores, and there was no evidence of catastrophic engine failure. The piston domes and combustion surfaces were coated in light-to-dark grey deposits. The exhaust pipes were crushed, and the exposed inner surfaces were coated in similarly colored deposits.

Each rocker cover was removed, and the rockers and valve springs were all intact and coated in oil.

#### **4.0 Propeller Examination**

The airplane was equipped with a two-blade composite propeller manufactured by NR Props. Maintenance records indicated that it was installed one month before the accident on November 8, 2023.

The propeller hub remained attached to the engine crankshaft flange (Figure 5). The ring gear and flywheel had fragmented and detached, along with the spinner. One blade root remained within the hub, but the blade had broken away and was found burnt within the main wreckage. The other blade was not located in the main wreckage and found ½ mile from the airplane, between the runway and the main accident site. That blade was undamaged and appeared to have come completely free from the hub (Figure 6).

#### **5.0 Examination Photographs**



**Figure 1 - Airplane-shaped impression**



**Figure 2 - Main wreckage**



**Figure 3 - Engine**



**Figure 4 - Spark plugs**



**Figure 5 - Propeller hub**



**Figure 6 - Propeller blade**

Submitted by:

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