

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24LA121

ENGINE EXAM

April 24, 2024

A. ACCIDENT

Location: Yucca Grove, California
Date: April 4, 2024
Airplane: Kitfox Series 5, N743JT

B. ENGINE EXAM

IIC	Elliott Simpson NTSB
Party Coordinator	Tom Vernon FAA Scottsdale FSDO

C. SUMMARY

The examination took place at the facilities of Air Transport, in Phoenix, AZ on April 23, 2024.

The engine of the experimental amateur-built airplane appeared to have lost most of its oil through a crack in the oil sump mounting flange. The flange showed evidence of a preexisting crack which had been inappropriately sealed with an epoxy putty by the pilot. The accident flight was the first since the repair.

No other anomalies were noted to the engine that would have precluded normal operation.

D. DETAILS OF THE EXAMINATION

1.0 Engine

Model: C90
Serial: 48622-6-16

The airplane did not appear to be fitted with a mechanical tachometer; however, it had a JPI 350 engine monitor, which had a tachometer feature that indicated 86.4 hrs.

The engine remained attached to the firewall, which appeared intact and largely undamaged. The fuselage sustained minimal damage, and the vertical stabilizer and rudder were bent about 20° right mid-span. The wings were intact and remained attached to the fuselage at the aft hinge point. The left wingtip was bent about 10°

aft, and both wings sustained scratches and punctures to their upper skin surfaces. The belly of the fuselage was coated in oil from the firewall through to the tail.

The upper and lower engine cowlings were removed, and oil was present on the inner aft surfaces of the lower cowl. The inner surface of the upper cowling was coated in mud. The dipstick indicated about 1.5 quarts of oil remaining in the sump. The sump was drained and appeared to contain about 1.0 quarts of oil, which was brown in color.

The oil filter was removed and opened, the filter was coated in brown oil, and no obvious metallic debris was observed.

The upper engine cooling deck was mostly dry, with evidence of oil drainage from the engine when it was inverted, but no evidence of oil leak (see figure 1). The carburetor, starter motor, alternator, and both magnetos remained firmly attached to their respective pads. The oil pressure and oil temperature senders were intact and did not appear to be leaking. All remaining oil fittings and lines were intact with no evidence of leak.

Closer examination revealed that the oil sump and surrounding components and fittings, including the back side of the carburetor, were coated in oil. A 3-inch-wide bead of grey filler material had been applied to the forward neck of the sump mount flange (see figures 2, 3). The bead had unbonded from the sump and the crack opened and closed when the sump was pushed forward and aft by hand (see video attachment 1).

The sump was removed, and a 4 inch long crack was found in the case on the other side of the filler bead. The bead was dark grey in color and could be easily pried off with a screwdriver revealing that the crack had propagated to the outside (see figure 4). The area of the sump where the filler had been installed showed evidence of sanding marks consistent with preparation, but most of the paint remained (see figure 5).

The pilot later confirmed the material used was "Steelstik" epoxy putty, manufactured by J-B Weld. He stated that the crack had been there since December 2023, but the leak was a "nuisance" and not significant with a total oil consumption of about 1 qt every 4-6 hours. He reported, "I performed multiple, lengthy, high power engine runs after the repair although the accident flight was the first flight after the repair".

The upper spark plugs were removed, and the engine could be rotated freely by hand. An impulse coupling could be heard to click with each rotation. The spark plugs were coated in dark brown to black deposits, and their gaps indicated "normal" service life when compared with the Champion Check-a-Plug chart.

The cylinders were examined through the plug bores with a borescope. There was no evidence of catastrophic failure, and the piston crowns were coated in light brown deposits. The cylinder walls were shiny in appearance and there were no scratches or gouges to indicate any piston rings had failed.

2.0 Examination Photos



Figure 1 - Top of the engine.

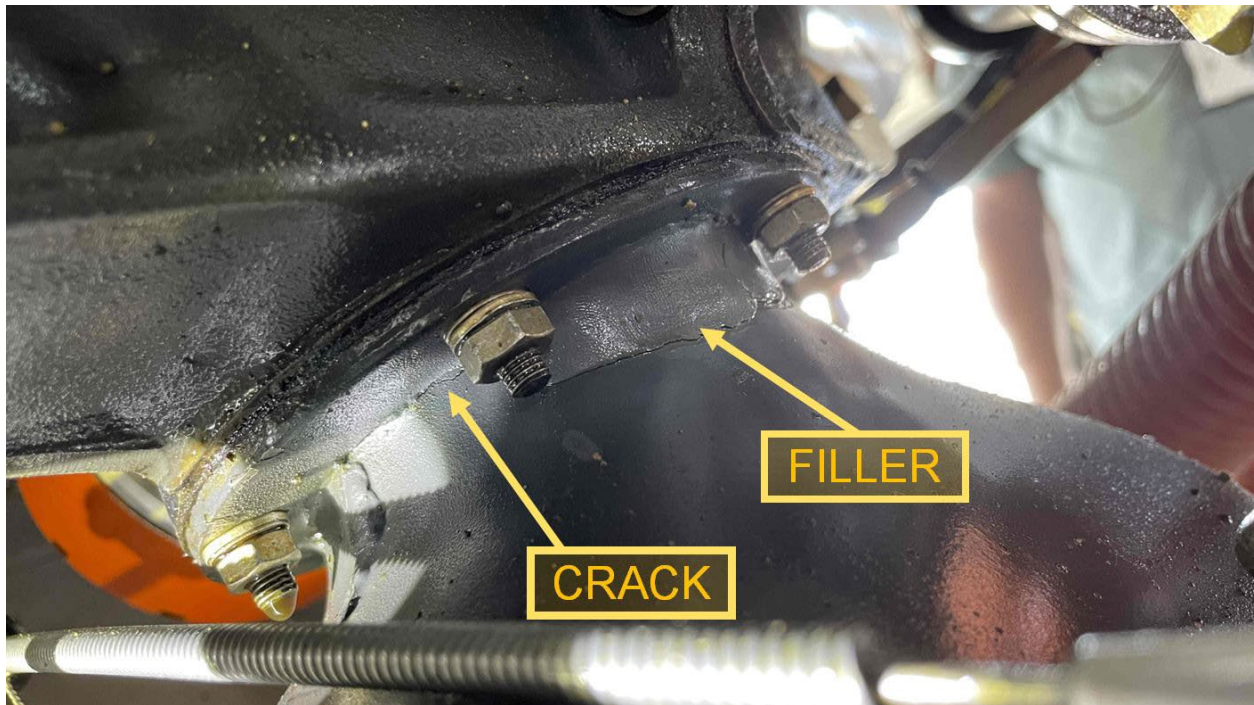


Figure 2 - Filler and crack at sump flange.

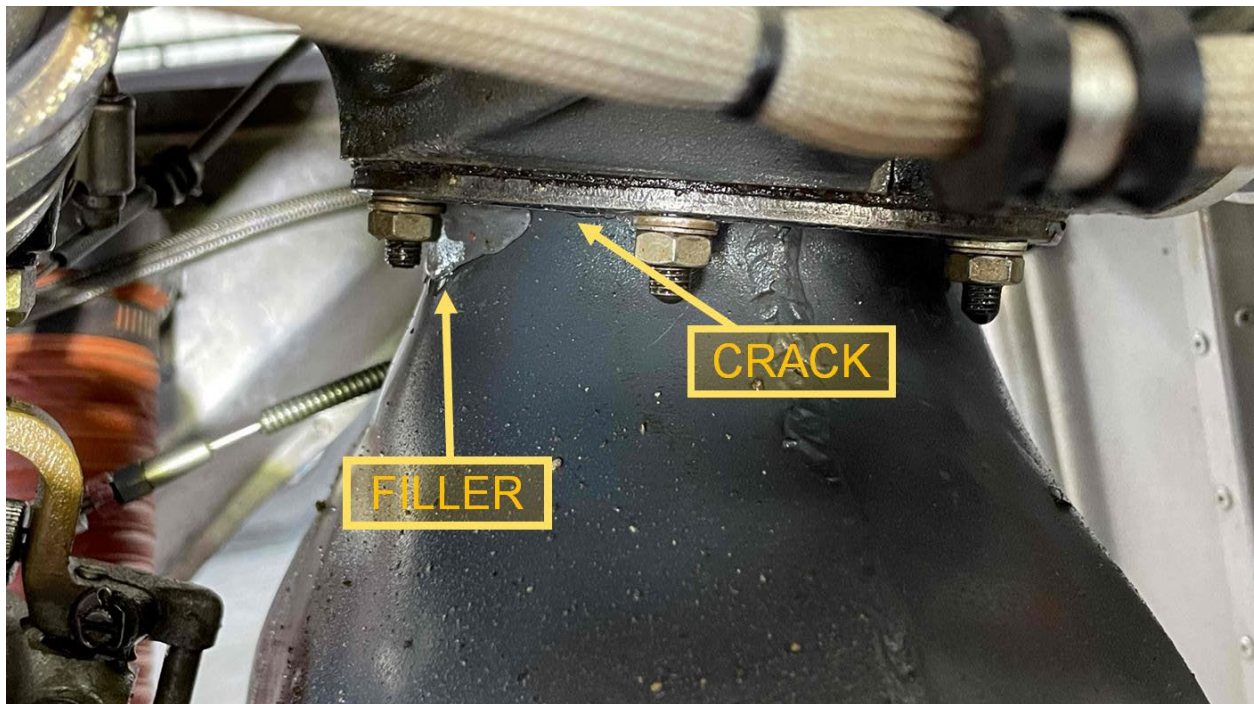


Figure 3 - Filler and crack at sump flange.

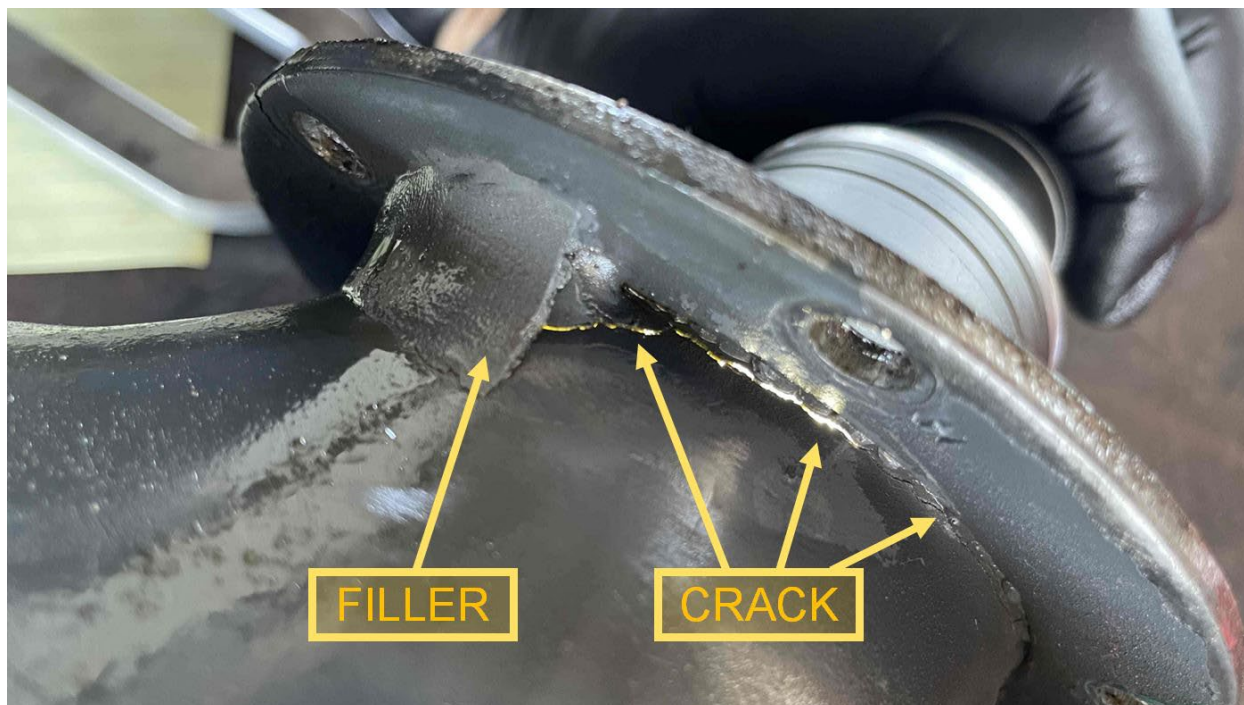


Figure 4 - Removed filler exposing crack at sump flange.

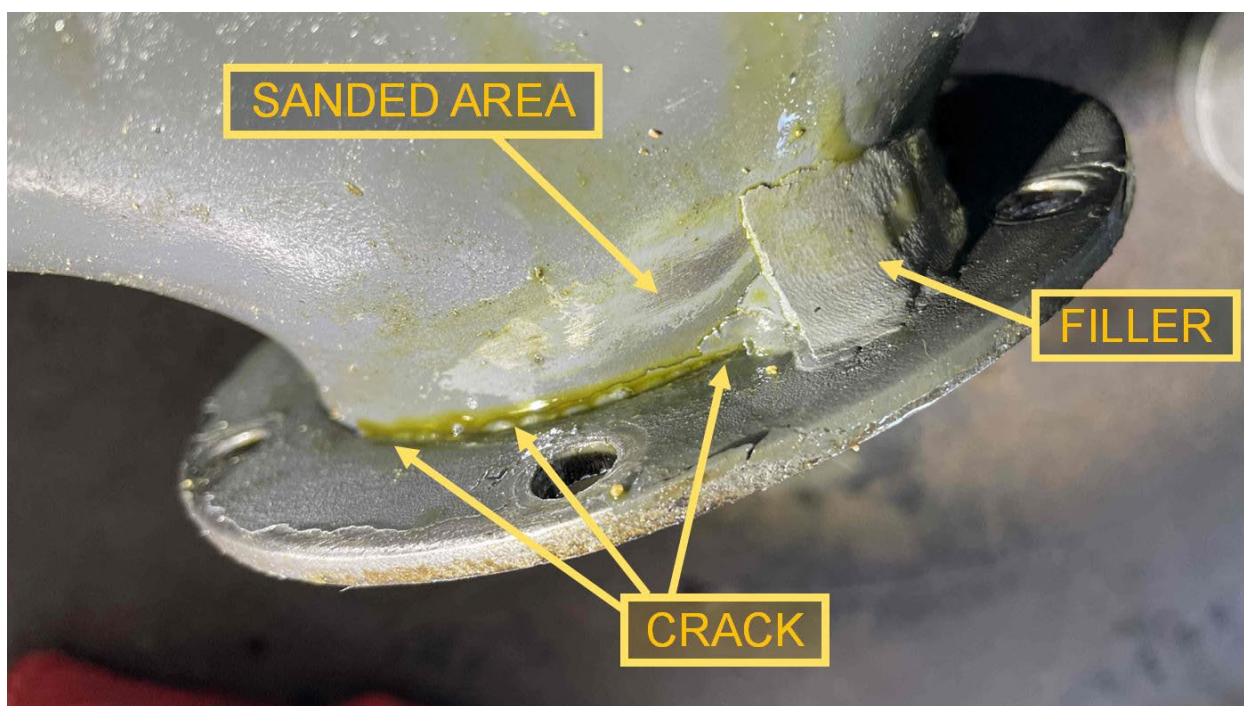


Figure 5 - Removed filler exposing crack at sump flange and sanded area.

Submitted by:

Elliott Simpson
Senior Aviation Accident Investigator

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