

April 12, 2023

Engine Failure Investigation for N298DM

Location: Rouge River Near Galice, OR Date & Time: May 31, 2022, 09:28 Local
Registration: N298DM Aircraft: Experimental RV-8 Injuries: 0 / Occupants: 2 Flight Conducted Under:
Part 91: Private Flight.

Crash Information:

At 9:28 a.m. Tuesday May 31,2022 N298DM a single-engine RV-8 aircraft reportedly started having engine trouble 10 minutes after departing Grants Pass Airport (3S8) over Hellgate Canyon and glided to smooth waters above Ennis Riffle near Galice, according to information from the Josephine County Sheriff's Office and Rural Metro Fire.

Both pilot and passenger walked away from a plane crash into the Rogue River Tuesday morning in Josephine County.

Local rafting outfitter OARS happened to be conducting water training nearby and "jumped into action," according to a post on Rural Metro Fire's Facebook page.

The raft team helped secure the plane to the riverbank, then shuttled the occupants, who were stranded on the opposite side of the river from a boat ramp, across the river to wait for rescuers.

Both occupants of the plane were uninjured in the crash and were later cleared by first responders following medical evaluations on shore.

With the assistance of a private boater who was on scene, Rural Metro firefighters deployed absorbent booms and pads downstream of the crash site "to capture what minimal fluid leaks might come from the wreckage," the post said. After an evaluation by the Josephine County the extraction of the craft was turned over to the pilot.

Aircraft Inspection:

A detailed investigation was carried out November – December 2022 at Rogue Aviation NW's Hangar at [REDACTED] Grants Pass, OR By Corey Mosley A&P [REDACTED]

Aircraft: N298DM SN: 80298 Van's RV-8 Experimental Aircraft/Engine Builder by Donald Marks A&P, IA (Deceased).

Pre-Aircraft Inspection Conditions as follows:

- Aircraft and Engine Total/Tach Time: 98.9 Hrs.
- Both L/H & R/H Wing Fuel tanks were drained for recovery from the river.
- The fuel sump was empty and dry.
- The engine had 9Qts of oil and presents of water.

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- Left Wing Leading Edge and Leading-Edge Fuel Tank Damaged from impact with water.
- The left inboard leading edge fuel tank was removed.
- Engine Cowlings were damaged and removed for transport.
- Main Landing gear wheel fairings missing
- 2 Blade Sensenich Propeller Model: 70CM6S9-0-80 SN: 35490K has one blade bent 20 degrees to the aft consistent with the impact of the water.
- The carburetor Airbox was damaged from the crash.
- Engine turned over freely by hand propping with compression resistance typical of normal aircraft engine operation.
- Throttle, Mixture and Propeller controls seem to operate normally.

Inspection of fuel system

- carburetor float bowl was full of water drained and cleaned.
- Right hand fuel tank was clean, no debris noted.
- fuel sump and filter was clean with only a small trace of sediment and debris.
- remove carburetor cleaned water and rusty sediment out reassembled and installed on aircraft to test fuel system.
- fuel system test, temporary fuel supply tank what's connected to aircraft fuel system both left and right fuel selector functioned correctly and provided fuel to the energized boost pump with A 6 PSI indication and fuel was present at the carburetor, throttle and mixture controls seem to function normally.
- The fuel priming system functioned correctly.
- The fuel system in my opinion was functioning correctly and supplying the engine with the needed fuel and was not the cause of engine failure.

Ignition system inspection

- Removed both Bendix Left PN: S4LN-20 SN: 546115 and Right PN: S4LN-21 SN: 628058 magnetos for inspection.
- Right hand Magneto inspection found no noted defects, functionally checked OK.
- Left hand Magneto inspected found minor wear on impulse coupling, functionally checked OK.
- Removed all cylinder valve (rocker box) covers, Rotated propeller to perform compression test found intake and exhaust valves DO NOT open or close with rotation of the propeller.
- I Suspects issue with accessory gears, prepared engine for removal to gain access to the accessory gear cover and rotating assembly.

Engine removal/accessory gear Inspection

- Lycoming Engine Model: O-320-E2D SN: L-20351-27A
- Removed engine from aircraft and installed on vertical mounted engine stand.
- Remove accessory cover from the aft end of engine.
- See below pictures of engine accessory gears, as removed no did center drive gear was missing retaining bolt from center.
- Removed both Magneto drive gears.

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- Removed center crankshaft drive gear, found alignment pin damaged and sheared off, drive gear mounting flange on end of crankshaft also damaged and material missing.
- Found mounting flange steel crankshaft debris in oil sump, missing bolt was not found.
- Oil residue/discoloration present around missing hold down bolt hole on crankshaft center gear bolt indicating bolt may have been missing or not installed since overhaul the prior 98 hours Total aircraft flight and engine time since install.

Inspection conclusion

In my professional opinion after inspecting this aircraft, I Corey Mosley have believe the Root cause of this accident was a mechanical failure of the engine due to the missing bolt in the crankshaft drive gear. The missing Bolt caused the crankshaft gear alignment pin to prematurely fail causing the rotating assemblies to suddenly stop causing the engines no longer providing power and forward thrust to the aircraft resulting of the emergency ditching of the aircraft into the Rogue River.

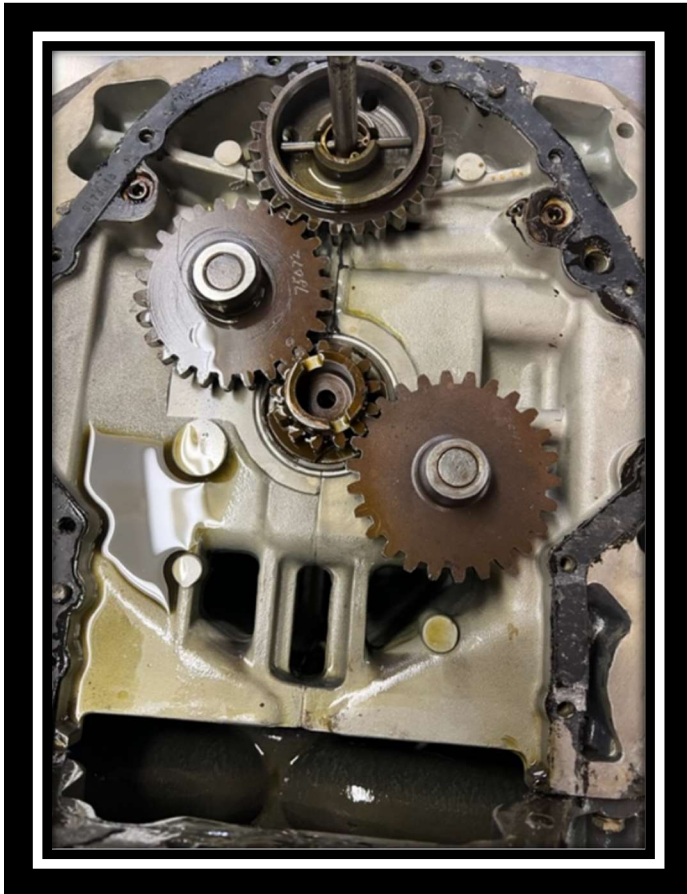


Figure 1 Crankshaft Gear Missing Hold Down Bolt, Image of gear assembly immediately after accessory cover removed.

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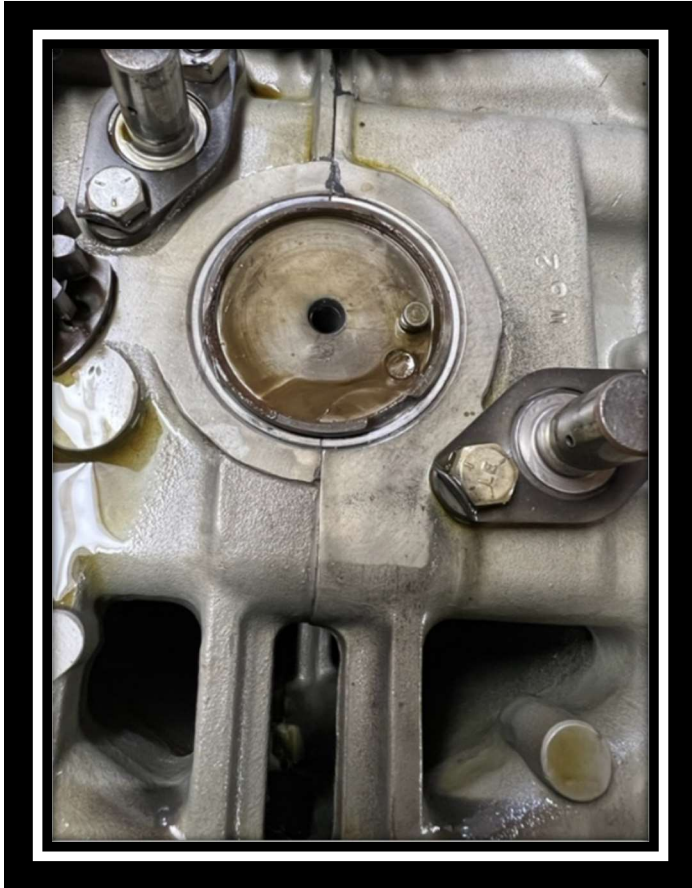


Figure 2 Crankshaft Gear Alignment Pin Sheared off.

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Figure 3 Close Up View of Gear Alignment Pin Sheared off and Missing Crankshaft Machined Gear Boss.

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Figure 4 Center Crankshaft Gear, Oil Pump Drive shaft, Sheared Gear Alignment Pin and Material from damaged Crankshaft machined Gear Boss.

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Figure 5 Rogue River Near Ennis Riffle Galice, OR

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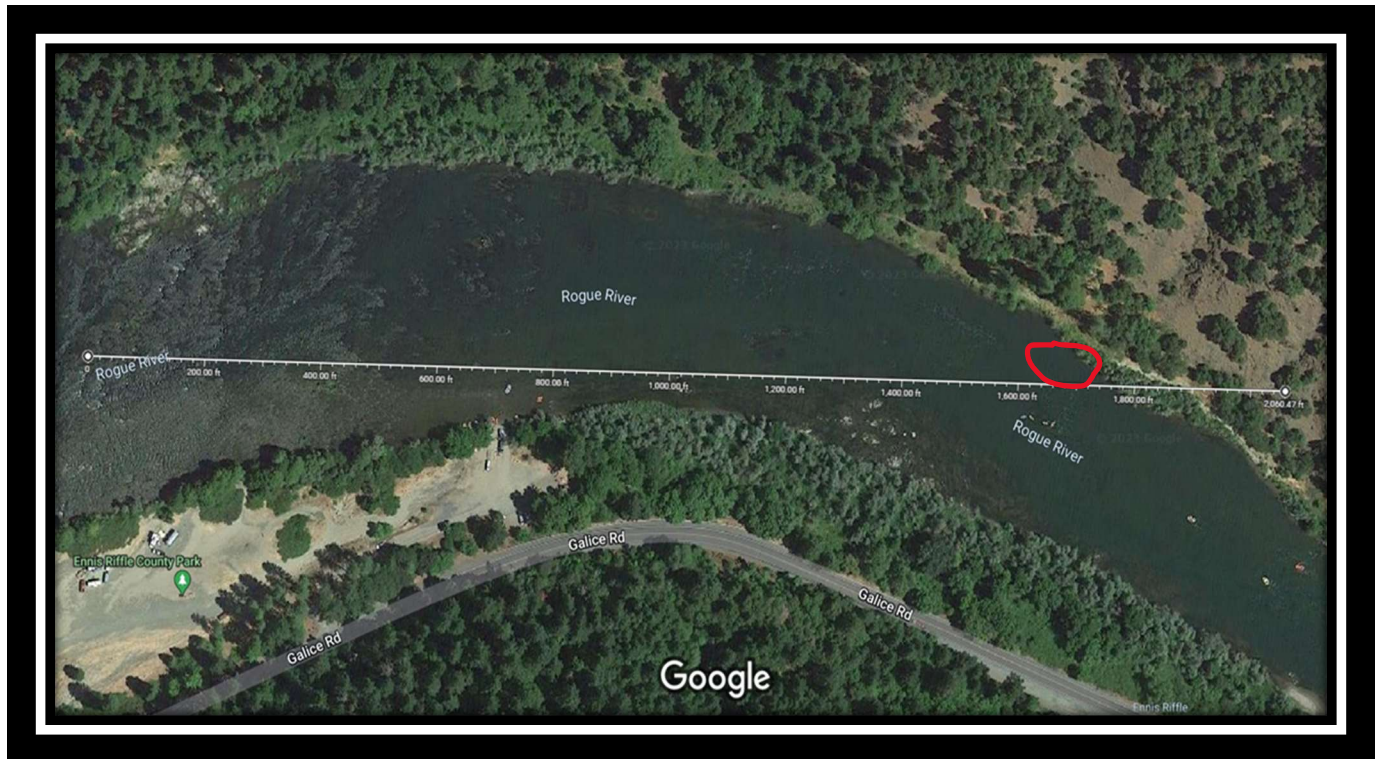



Figure 6 N298DM Came to rest near the 1800 FT mark on this Image. 

End