Aviation Investigation Final Report

Location:	Galice, Oregon	**Accident Number:**	WPR22LA193
Date & Time:	May 31, 2022, 09:40 Local	**Registration:**	N298DM
Aircraft:	Vans RV-8	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was maneuvering the airplane over a river about 3,000 feet above mean sea level (msl) with the engine operating at 2,200 rpm. After a few minutes, the pilot heard a “pop” emanating from the engine compartment followed by a loss of engine power. With no suitable terrain to land in the area, the pilot opted to ditch in the river adjacent to the shoreline. The airplane touched down in a calm current near some exposed rocks. A team of swift-water rescue divers arrived at a boat ramp across the river with the intention of performing a training exercise that morning. The team carried the pilot and passenger to shore without injury.

A postaccident examination revealed that the crankshaft gear was missing its retaining bolt and lock-plate. The alignment dowel was sheared off and the crankshaft gear’s mounting flange was damaged. Mounting flange material was found in the sump, but the missing bolt and lock-plate were not found, likely because it was never installed at the last overhaul (98.9 hours before the accident).

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The in-flight failure of the crankshaft gear’s alignment dowel as a result of the retaining bolt not being installed, which lead to a total loss of engine power.

Findings

Personnel issues	Forgotten action/omission - Maintenance personnel
Aircraft	Recip eng rear section - Incorrect service/maintenance

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)

On May 31, 2022, at 0940 Pacific daylight time, a Vans RV-8, N298DM, sustained substantial damage when it was involved in an accident near Galice, Oregon. The pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot completed a 20-minute flight and landed in Grants Pass, Oregon, with the intention of picking up his spouse. The airplane started normally and they departed from runway 31 about 0930. The pilot continued to the west until reaching the Rouge River, where he maneuvered over the river about 3,000 feet above mean sea level (msl) with the engine operating at 2,200 rpm. After a few minutes, the pilot heard a "pop" emanating from the engine compartment followed by a loss of engine power. The pilot added full throttle, verified the mixture was full rich, cycled the magnetos, and switched the fuel selector position to the other tank. Despite the pilot's troubleshooting attempts, the engine did not restart.

The pilot looked for a location to perform an emergency landing and noted that the airplane was too high to align with the gravel bars in the immediate vicinity. With no suitable terrain ahead, he opted to ditch in the river adjacent to the shoreline. The airplane touched down in a calm current near some exposed rocks. The airplane settled on rocks and the pilot and passenger sat on the canopy for about 15 minutes. A team of swift-water rescue divers arrived at a boat ramp across the river with the intention of performing a training exercise that morning. The team carried the pilot and passenger to shore without injury.

During the accident sequence, the left wing was substantially damaged. The pilot estimated that there was about 30 gallons of fuel onboard the airplane at the time of the accident.

The engine was overhauled prior to being installed on the airplane. The airplane and overhauled engine had amassed 98.9 flight hours before the accident.

A Federal Aviation Administration certified Airframe and Powerplant Mechanic examined the wreckage. He stated that upon rotation of the propeller, the rocker arms on the intake and exhaust valves did not move. Removal of the accessory gear housing revealed that the

crankshaft gear was missing its retaining bolt and lock-plate (see Figure 1 below). After removing the gear, he noted the alignment dowel was sheared off and the crankshaft gear's mounting flange was damaged. He removed the oil sump and found debris consistent with the mounting flange material but was unable to locate the missing bolt.

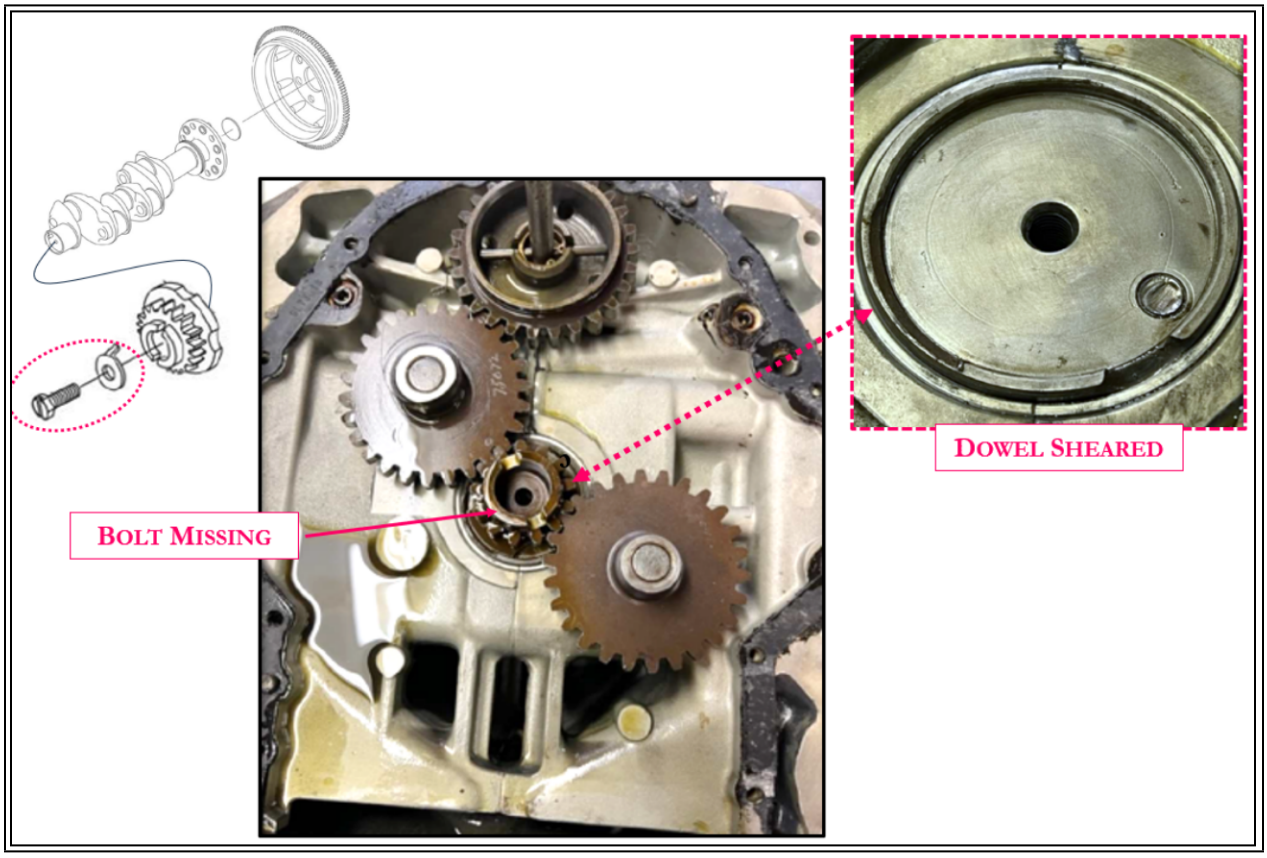

Figure 1: Accessory Housing Removed (pictures provided by mechanic)

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	51,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	February 21, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 11, 2022
Flight Time:	3257 hours (Total, all aircraft), 47 hours (Total, this make and model), 2916 hours (Pilot In Command, all aircraft), 218 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Vans	**Registration:**	N298DM
Model/Series:	RV-8	**Aircraft Category:**	Airplane
Year of Manufacture:	2002	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	80-298
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	June 1, 2021 Continuous airworthiness	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	45 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	97 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-320-E2D
Registered Owner:	On file	**Rated Power:**	160
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSXT,3841 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	09:46 Local	**Direction from Accident Site:**	76°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	19.4°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Grants Pass, OR (3S8)	**Type of Flight Plan Filed:**	None
Destination:	Grants Pass, OR (3S8)	**Type of Clearance:**	None
Departure Time:	09:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	GRANTS PASS 3S8	**Runway Surface Type:**	
Airport Elevation:	1130 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	42.563495,-123.5747(est)

Administrative Information

Investigator In Charge (IIC):	Keliher, Zoe
Additional Participating Persons:	Jason Lawver; Federal Aviation Administration; Hillsboro, OR
Original Publish Date:	April 10, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105169