



Aviation Investigation Final Report

Location:	Henefer, Utah	Accident Number:	WPR20LA239
Date & Time:	July 26, 2020, 11:10 Local	Registration:	N514BS
Aircraft:	Vans RV7	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that during the flight, he switched fuel tanks and shortly after, the engine began to sputter. The pilot turned on the electric fuel boost pump and switched the fuel selector valve to the original position, and the engine began to operate normally. However, a short time later, the engine quit, and despite his attempts, he was unable to restore engine power. The pilot initiated a forced landing to a nearby road during which the left wing struck the ground, the airplane veered to the left, exited the surface of the road, and impacted rising terrain.

Postaccident examination of the engine revealed that the crankshaft idler gear shaft was separated from its mount and the idler gear was disengaged from the crankshaft and camshaft. Fretting was observed within the area of the idler gear shaft mount. The idler gear shaft bolts were separated. No evidence of a locking plate or safety wire was observed. It's likely that idler gear bolts had become loose due to improper installation, which allowed the idler gear shaft to shift and the idler gear to become disengaged from the crankshaft and camshaft, which would result in a loss of engine power.

Probable Cause and Findings

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

The total loss of engine power due to the separation of the idler gear shaft bolts as a result of improper installation, which allowed for the idler gear to become disengaged.

Findings

Aircraft	Recip eng rear section - Failure
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Maneuvering	Loss of engine power (total) (Defining event)
Landing-landing roll	Collision with terr/obj (non-CFIT)

On July 26, 2020, about 1110 mountain daylight time, a Vans RV7, N514BS, was substantially damaged when it was involved in an accident near Henefer, Utah. The pilot sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that while flying at an altitude of about 10,000 ft mean sea level, he switched fuel tanks and shortly after, the engine began to sputter. The pilot turned on the electric fuel boost pump and switched the fuel selector valve to the original position, and the engine began to operate normally. However, a short time later, the engine began to sputter a second time. Despite his attempts, he was unable to restore engine power and initiated a forced landing to a nearby road. During landing, the left wing struck the ground, and the airplane veered to the left off the surface of the road and impacted rising terrain. Both wings and fuselage were structurally damaged.

Examination of the Lycoming IO-540-C4B5 engine by a Federal Aviation Administration inspector revealed that the crankshaft idler gear shaft was separated from its mount and the idler gear was disengaged from the crankshaft and camshaft. The idler gear shaft bolts were separated with no locking tabs or safety wire present. Photos supplied by the inspector showed that both the left idler gear shaft bolt holes were elongated, and the entire mounting area was severely worn and exhibited areas of fretting. The left idler gear interconnects the crankshaft, camshaft, left magneto, and fuel pump drive gears. (See figure 1)

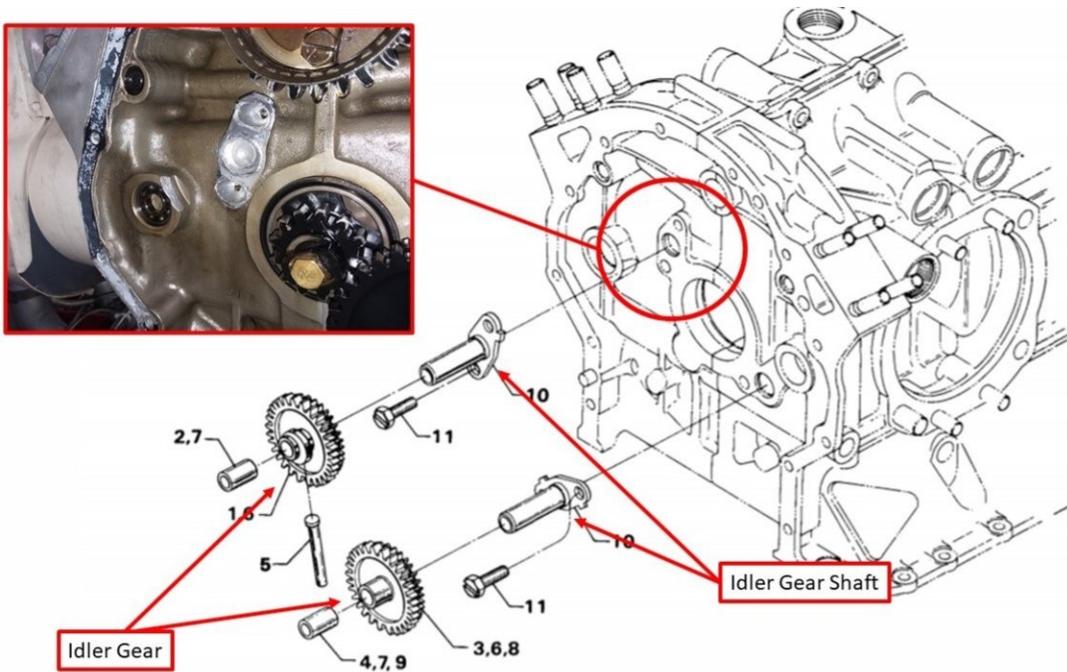


Figure 1: View of the idler gear and idler gear shaft assembly.

Pilot Information

Certificate:	Airline transport; Flight instructor	Age:	66, Male
Airplane Rating(s):	Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Powered-lift	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	August 20, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	June 1, 2020
Flight Time:	21000 hours (Total, all aircraft), 120 hours (Total, this make and model), 13000 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Vans	Registration:	N514BS
Model/Series:	RV7	Aircraft Category:	Airplane
Year of Manufacture:	2005	Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	70845
Landing Gear Type:	Tailwheel	Seats:	
Date/Type of Last Inspection:	April 20, 2020 Condition	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540
Registered Owner:	On file	Rated Power:	
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:	KOGD,4439 ft msl	Distance from Accident Site:	25 Nautical Miles
Observation Time:	16:53 Local	Direction from Accident Site:	300°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	20°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.15 inches Hg	Temperature/Dew Point:	30°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ogden, UT (KOGD)	Type of Flight Plan Filed:	None
Destination:	Heber City, UT	Type of Clearance:	None
Departure Time:	10:50 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	40.986667,-111.529724(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Kenneth Joyce; Federal Aviation Administration; Salt Lake City, UT
Original Publish Date:	July 12, 2022
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=101671

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).