Aviation Investigation Final Report

Location:	Seattle, Washington	**Accident Number:**	WPR23LA196
Date & Time:	May 18, 2023, 18:17 Local	**Registration:**	N2550L
Aircraft:	Cessna 172H	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, as the airplane descended to 1,000 ft mean sea level (msl) crossing over a bay, the engine sustained a partial loss of power. The pilot declared an emergency and performed a forced water ditching.

Examination of the engine revealed a stuck exhaust valve on the No. 4 cylinder. The No. 4 cylinder was removed for further examination. The exhaust valve guide exhibited evidence of oil coking along with an area of polishing on one side of the guide. A slight amount of discoloration consistent with corrosion was observed adjacent to the polished area. The exhaust valve stem was intact with some coking near the valve fillet and the intake valve exhibited moderate coking. It is likely that the coking resulted in the valve getting stuck. The Nos. 2 and 4 cylinder cooling fins exhibited thermal discoloration. A visual inspection of the internal area of the crankcase showed the crankshaft and camshaft did not reveal any anomalies or mechanical damage. The No. 4 cylinder had been serviced and reinstalled with a new cylinder kit 143 flight hours before the accident and the most recent annual inspection was about 11 months before the accident.

Probable Cause and Findings

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

A stuck exhaust valve that resulted in a partial loss of engine power and a forced water ditching.

Findings

Aircraft	Recip eng cyl section - Damaged/degraded
Aircraft	(general) - Related maintenance info

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (partial) (Defining event)
Landing	Ditching

On May 18, 2023, about 1817 Pacific daylight time, a Cessna 172H airplane, N2550L was substantially damaged when it was involved in an accident near Seattle, Washington. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that, while in cruise flight at 1,000 ft msl nearing the destination airport, he heard an audible change in engine rpm. The engine tachometer indicated 1,400 rpm instead of the expected 2,000 rpm. There were no other abnormal engine sounds or indications on the instrument panel. The pilot attempted to troubleshoot; however, the engine rpm continued to decrease. No longer able to maintain altitude, the pilot declared an emergency and ditched the airplane into a bay, avoiding populated areas.

A postaccident examination of the engine revealed the No. 4 cylinder exhaust valve was stuck in the partially open position. The intake valve was removed with little effort; however, the exhaust valve was removed with a punch and hammer along with significant force. The exhaust valve guide exhibited evidence of oil coking along with an area of polishing on one side of the guide. A slight amount of discoloration consistent with corrosion was observed adjacent to the polished area. The exhaust valve stem was intact with some coking near the valve fillet. The intake valve had moderate coking. The cooling fins on cylinder Nos. 2 and 4 exhibited thermal discoloration. All intake and exhaust valve springs were found intact and undamaged. The intake and exhaust pushrods were intact and undamaged. The No. 4 piston exhibited evidence of corrosion and combustion deposits were observed on the piston face. All piston rings were intact and had various degrees of corrosion and contamination throughout. The internal area of the crankcase, the camshaft, and crankshaft were found to be unremarkable.

The aircraft maintenance logbook revealed that the engine had a major overhaul September 8, 1995. On March 16, 2022, the No. 4 cylinder was serviced and reinstalled with a new cylinder kit. The exhaust and intake valve guides were reamed, and the valves were reinstalled. At that time, the engine had accumulated 1,021.8 hours since major overhaul. The airplane had 143.2 total flight hours from the time of the No. 4 cylinder servicing until the accident and the engine had 1,165 total hours since new at the time of the accident. The airplane's most recent annual inspection was completed on June 8, 2022. The annual inspection included replacement of the

No. 4 cylinder exhaust stack. The engine manufacturer recommended overhaul time for the engine was 1,800 hours or 12 years, whichever occurred first.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	42,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	October 23, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 25, 2021
Flight Time:	1489 hours (Total, all aircraft), 513 hours (Total, this make and model), 1143 hours (Pilot In Command, all aircraft), 63 hours (Last 90 days, all aircraft), 23 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N2550L
Model/Series:	172H	**Aircraft Category:**	Airplane
Year of Manufacture:	1967	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17255750
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 9, 2022 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	1280 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4030 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed	**Engine Model/Series:**	O-300
Registered Owner:	On file	**Rated Power:**	180 Horsepower
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:	KBFI,25 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	17:53 Local	**Direction from Accident Site:**	158°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	None /
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	24°C / 16°C
Precipitation and Obscuration:	Moderate - None - Smoke		
Departure Point:	Port Townsend, WA (0S9)	**Type of Flight Plan Filed:**	None
Destination:	Seattle, WA (S50)	**Type of Clearance:**	VFR
Departure Time:	17:50 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	47.613142,-122.35534

Administrative Information

Investigator In Charge (IIC):	Blum, Contessa
Additional Participating Persons:	Eric Correa; FAA Seattle FSDO; Seattle, WA
Original Publish Date:	June 20, 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=192220