



# Aviation Investigation Final Report

<b>Location:</b>	Modesto, California	<b>Accident Number:</b>	WPR24LA167
<b>Date &amp; Time:</b>	June 2, 2024, 12:51 Local	<b>Registration:</b>	N7522U
<b>Aircraft:</b>	CANADIAN CAR & FOUNDRY HARVARD MK IV	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fuel exhaustion	<b>Injuries:</b>	2 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot reported that during the flight to his return airport, his cruise altitudes had varied from 4,000 ft to 8,000 ft mean sea level (msl) due to mountainous terrain. About an hour into the flight, he switched to the left reserve fuel tank, when the engine began to sputter. Despite switching back to the right fuel tank, the engine lost all power. The pilot initiated a forced landing to an open field and during the landing, the airplane impacted a covered dirt berm, substantially damaging the forward fuselage and left wing.

The pilot reported that 2 days prior to the accident, he had topped the airplane off with fuel, which totaled 110 gallons at his home airport. He then flew 2 hours to another airport, with a cruise altitude that ranged between 4,000 to 8,000 ft msl due to mountainous terrain.

On the day of the accident, the pilot conducted a preflight inspection on the airplane, which included a visual only inspection of the fuel level in the fuel tanks, which he estimated was about 65 gallons, or enough fuel for the return flight to his home airport.

Post accident examination of the airplane revealed that, the airplane came to rest upright in a level attitude, and the fuel selector lever was observed in the left tank position and would not move. Damage to the fuel line near the center fuselage, was consistent with impact, and the fuel line was not breached. Recovery personnel reported that there was no fuel was recovered from the left fuel tank, and about 1/2 gallon of fuel was recovered from the right fuel tank. However, it was later reported after the airplane had been recovered, the left tank had about 5 to 10 gallons of fuel.

The airplane was equipped with two 55-gallon fuel tanks, of which 51 gallons were considered usable. The selector lever had four positions, "LEFT," "RIGHT," "RESERVE," and "OFF." The left fuel tank was designed to have fuel drawn from two different locations as the fuel tank was equipped with a standpipe. The left position drew fuel from the upper portion of the fuel tank with 33.5 gallons of usable fuel, while the reserve position drew fuel from the bottom of the left fuel tank, with 17.5 gallons of useable fuel.

A subsequent examination of the accident airplane revealed that the left wing fuel tank was not breached. The fuel selector valve and lever, wobble pump, and engine driven fuel pump were removed, with no visible damage to any of the components. Once removed, the fuel selector handle was free to rotate to all the positions on the fuel selector valve. A functional test of the fuel system revealed that when the fuel selector lever was in the "RESERVE" position, with the other ports capped off, interrupted fuel was observed flowing through a clear tube attached to the outlet. When the other fuel ports were uncapped, air bubbles were seen flowing in the fuel outlet line. The same functional test was performed at the other inlet positions for the fuel selector valve with less air bubbles observed.

For flight planning purposes, the pilot estimated 30 gal an hour (gph). According to the Pilot's Operating Instructions for airplane, the fuel supply is "normally sufficient for 3.9 hours cruising." However, at "High Power," the fuel consumption ranges from 30 gph to 56 gph depending on what RPM and manifold pressure settings were used.

The total amount of fuel onboard the airplane before the accident flight could not be determined. Given the lack of fuel found in the right tank after the accident and the limited fuel in the left tank, it is likely that the pilot failed to ensure that the fuel selector lever was placed in the "RESERVE" detent, and mistakenly selected the "LEFT" position, which resulted in a total loss of engine power due of fuel starvation.

## **Probable Cause and Findings**

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

The pilot's improper fuel tank selection, which resulted in a total loss of engine power due to fuel starvation. Contributing to the accident was a malfunctioning fuel selector at low fuel levels.

## Findings

<b>Aircraft</b>	Fuel - Fluid management
<b>Personnel issues</b>	Use of equip/system - Pilot
<b>Aircraft</b>	Fuel selector/shutoff valve - Malfunction

## Factual Information

### History of Flight

Enroute-cruise	Fuel exhaustion (Defining event)
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### Pilot Information

Certificate:	Commercial; Private	Age:	51,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	BasicMed With waivers/limitations	Last FAA Medical Exam:	November 18, 2022
Occupational Pilot:	No	Last Flight Review or Equivalent:	June 17, 2023
Flight Time:	(Estimated) 1081 hours (Total, all aircraft), 72 hours (Total, this make and model), 936 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft)		

### Passenger Information

Certificate:		Age:	Female
Airplane Rating(s):		Seat Occupied:	Rear
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	CANADIAN CAR & FOUNDRY	<b>Registration:</b>	N7522U
<b>Model/Series:</b>	HARVARD MK IV	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1952	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	CCF-4-214
<b>Landing Gear Type:</b>	Retractable - Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	January 1, 2024 Annual	<b>Certified Max Gross Wt.:</b>	5300 lbs
<b>Time Since Last Inspection:</b>	17 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	8383.3 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Pratt & Whitney
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	R-1340 AN-1
<b>Registered Owner:</b>	PAY IT FORWARD AVIATION LLC	<b>Rated Power:</b>	600 Horsepower
<b>Operator:</b>	PAY IT FORWARD AVIATION LLC	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KMOD,87 ft msl	<b>Distance from Accident Site:</b>	2 Nautical Miles
<b>Observation Time:</b>	12:53 Local	<b>Direction from Accident Site:</b>	270°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	13 knots / 17 knots	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	340°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	29.9 inches Hg	<b>Temperature/Dew Point:</b>	27°C / 10°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Paso Robles, CA (PRB)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Ione, SC (CA20)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:45 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	MODESTO CITY-COUNTY-HARRY SHAM FLD MOD	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	99 ft msl	<b>Runway Surface Condition:</b>	Dry;Rough
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Minor	<b>Latitude, Longitude:</b>	37.624957,-120.90517(est)

## Administrative Information

Investigator In Charge (IIC):	Gutierrez, Eric
Additional Participating Persons:	David L. Lopes; FAA; Fresno, CA
Original Publish Date:	February 12, 2025
Last Revision Date:	
Investigation Class:	<a href="#">Class 4</a>
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	<a href="https://data.nts.gov/Docket?ProjectID=194378">https://data.nts.gov/Docket?ProjectID=194378</a>

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](#).