



# Aviation Investigation Final Report

<b>Location:</b>	San Angelo, Texas	<b>Accident Number:</b>	CEN21LA243
<b>Date &amp; Time:</b>	May 27, 2021, 18:25 Local	<b>Registration:</b>	N274CV
<b>Aircraft:</b>	PHILLIPS RALPH W VANS RV8	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 Serious
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

Shortly after takeoff, the pilot reported an “engine failure” to the airport tower controller. The airplane impacted terrain off the end of the runway. The airplane came to rest upright, with substantial damage to the fuselage and wings during the accident.

The airplane had undergone maintenance with the installation of a new glass panel system, and the accident flight was the first flight after the installation. The avionic shop drained about 40 gallons of fuel from the tanks and added the fuel back for calibration.

The installation of the glass panel also added a fuel flow transducer to the fuel line, between the pressure side of the engine driven fuel pump and carburetor. The engine-driven fuel pump outflow fitting had two fittings installed. The 3/8” port was capped off with an AN929 fitting. The other port had a number 4 reduced flow fitting installed in the fuel line leading to the carburetor (through the fuel flow transducer).

The reduced flow fitting would have prevented sufficient fuel flow to the carburetor once the fuel in the carburetor was consumed. The accident is consistent with the loss of engine power due to fuel starvation.

## Probable Cause and Findings

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

The loss of engine power due to fuel starvation. Contributing to the accident was the installation of a reduced flow fitting in the fuel line to the carburetor by maintenance personnel.

## Findings

<b>Personnel issues</b>	Installation - Maintenance personnel
<b>Aircraft</b>	Fuel distribution - Incorrect service/maintenance
<b>Aircraft</b>	Fuel - Incorrect service/maintenance

# Factual Information

## History of Flight

Takeoff	Loss of engine power (total) (Defining event)
Prior to flight	Aircraft maintenance event
Takeoff	Fuel starvation

On May 27, 2021, about 1825 central daylight time, a Vans RV-8 airplane, N274CV, was substantially damaged when it was involved in an accident near San Angelo, Texas. The pilot was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* personal flight.

Shortly after takeoff, the airplane came to rest upright, with substantial damage to the fuselage and wings.

The responding Federal Aviation Administration (FAA) inspector reported that the fuel tanks seemed empty but appeared to have been breached in the accident. The airplane had undergone maintenance with the installation of a Garmin G3 system, and the accident flight was the first flight after the installation. He also noted that the avionic shop drained about 40 gallons of fuel from the tanks and added the fuel back for calibration.

The airplane was recovered to a salvage yard, where the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) conducted an examination. The top set of sparkplugs were removed from each cylinder, and the engine rotated by hand. Continuity through the valve train and to the accessory section was noted. The left and right magnetos were removed and, when rotated, produced a spark on each terminal.

The fuel system was equipped with a fuel flow transducer located in the fuel line between the pressure side of the engine-driven fuel pump and carburetor (see figure 1). The addition of the fuel flow transducer was required to provide fuel flow reading on the new panel.



Figure 1: “Red Cube” Fuel Flow Transducer

The pressure side of the engine driven fuel pump outflow fitting had two fittings installed. The 3/8's port was capped off with an AN929 fitting. The other port had a number 4 fitting installed in the fuel line (which ran to the fuel flow transducer – see figure 2 & 3).

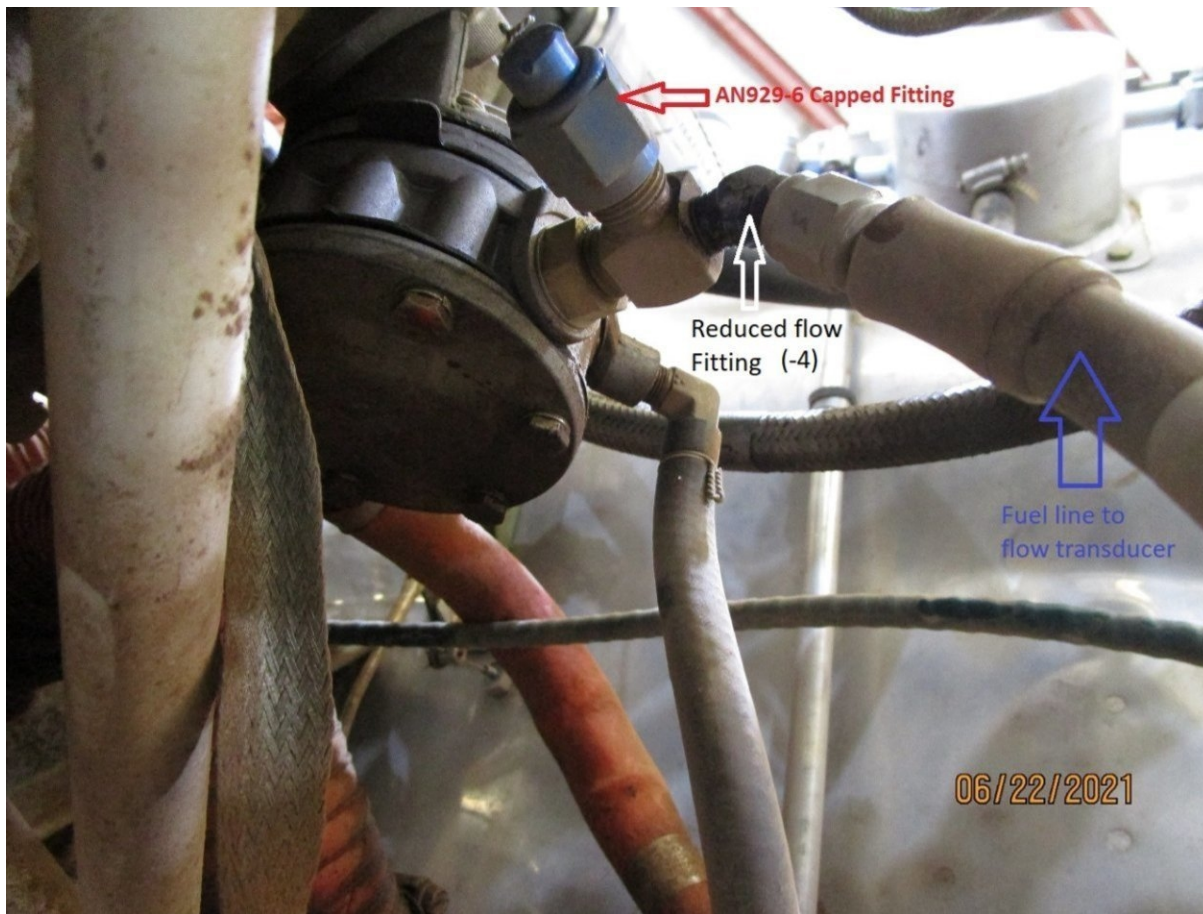


Figure 2: Fuel Line as it exited to the Engine Driven Fuel Pump





Figure 3: Fuel Pump Fittings

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	60
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	BasicMed With waivers/limitations	<b>Last FAA Medical Exam:</b>	January 29, 2021
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	PHILLIPS RALPH W	<b>Registration:</b>	N274CV
<b>Model/Series:</b>	VANS RV8	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	81039
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	September 3, 2020 Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	600 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C126 installed	<b>Engine Model/Series:</b>	O-360-A1A
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	On file	<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>	KSJT, 1918 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	18:43 Local	<b>Direction from Accident Site:</b>	
<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>	3 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	190°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.87 inches Hg	<b>Temperature/Dew Point:</b>	32°C / 18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	San Angelo, TX	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	San Angelo, TX	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Mathis Field SJT	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>		<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	18	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	8054 ft / 75 ft	<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Serious	<b>Latitude, Longitude:</b>	31.358029,-100.50069



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Corey Wehmeyer; FAA FSDO; Lubbock, TX
<b>Original Publish Date:</b>	August 12, 2022
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=103180">https://data.nts.gov/Docket?ProjectID=103180</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](#).