

INVESTIGATION SUPPLEMENTAL INFORMATION

HISTORY OF FLIGHT

On April 03, 2022, at 1310 Pacific daylight time, a Soneria IIL, N333BM, sustained substantial damage when it was involved in an accident near Jean, Nevada. The pilot sustained serious injuries. The airplane was operated as a Title 14 Code of Federal Regulations(CFR) Part 91 personal flight.

The pilot stated that he departed from Kingman, Arizona with the intention of landing at his home airport in North Las Vegas, Nevada. Prior to the flight, he added 3.8 gallons of fuel, but did not know the total amount of fuel on board at the time of departure. While en route, the pilot opted to divert to Jean, Nevada because of the gusty wind conditions in Kingman. During the flight, he noted that there were strong headwinds but thought he had adequate fuel onboard. When arriving in the proximity of Jean, the pilot made a low pass over the airport in an effort to evaluate the wind conditions. While maneuvering to land on runway 20, the engine experienced a loss of power. The pilot was unable to maintain level altitude and collided with the desert terrain about 0.5 miles north of the approach end of the runway.

The Clark County Fire Department responded to the accident site. Fire personnel stated that a visual examination of the fuel quantity indicator showed the fuel tank was empty. This was confirmed by opening the fuel cap, visually examining the inside of the tank, and then inserting a dipstick.



Figure 1: Airplane Wreckage at Accident Site (photo provided by Las Vegas Police Department)

EXAMINATION

FUEL SYSTEM

The airplane's fuel system was a gravity-fed design where fuel flowed from an aluminum 10-gallon tank mounted in front of the instrument panel. Inside the tank there was a finger screen at the outlet and at the top of the tank was a vent output port. The port connected to a T-fitting where one clear plastic tube was routed to the instrument panel and back to the bottom of the tank. On the tube there was a series of different colored tie-raps that served a fuel quantity indicator for the pilot. The other tube on the T-fitting was routed to the bottom of the airplane and functioned as a vent. From the fuel tanks, the fuel was routed to a fuel shutoff valve and then through several fittings through the firewall to a gascolator (mounted on the engine-side of the firewall). The fuel would then continue to a fuel injector unit, an AeroInjector 35, where it was routed from the inlet through an orifice to the air inlet. From the inlet, the fuel-air mixture continued into the intake manifold and into each cylinder. A majority of the fuel pipe fittings had Teflon tape on the threads.

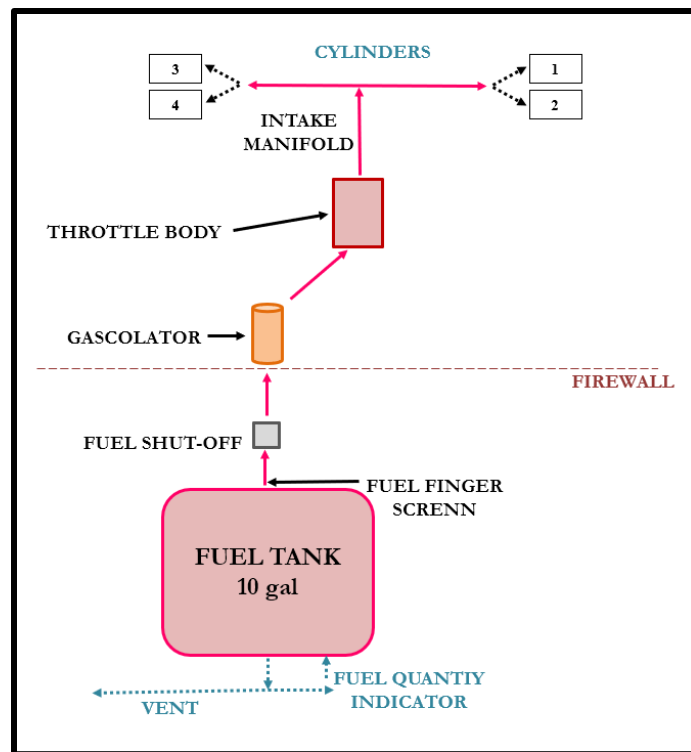


Figure 2: Fuel System Diagram

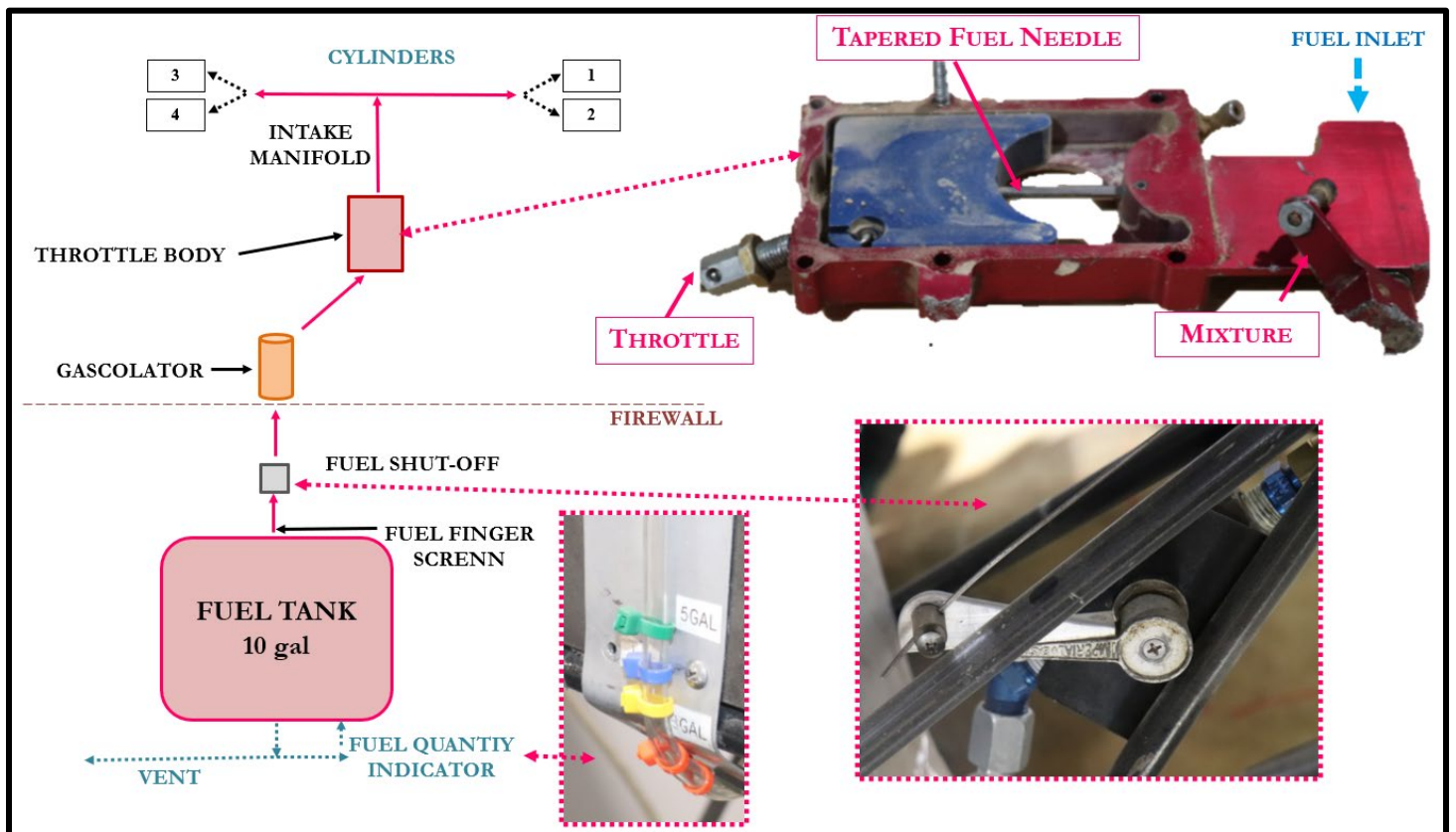


Figure 3: Fuel System (as found)

A post-accident examination revealed that there was no fuel onboard the airplane. The entire system remained unbreached except where the gascolator drain was compromised (pushed upward in the open position). The gascolator was clean and no debris was in the screen. The fuel throttle body was impact damaged and there was debris inside the slide cavity. The tapered fuel needle remained in the fuel orifice and the throttle slide was in a

partially open position, consistent with near full throttle. The air filter was not located and presumed to be left at the accident site.

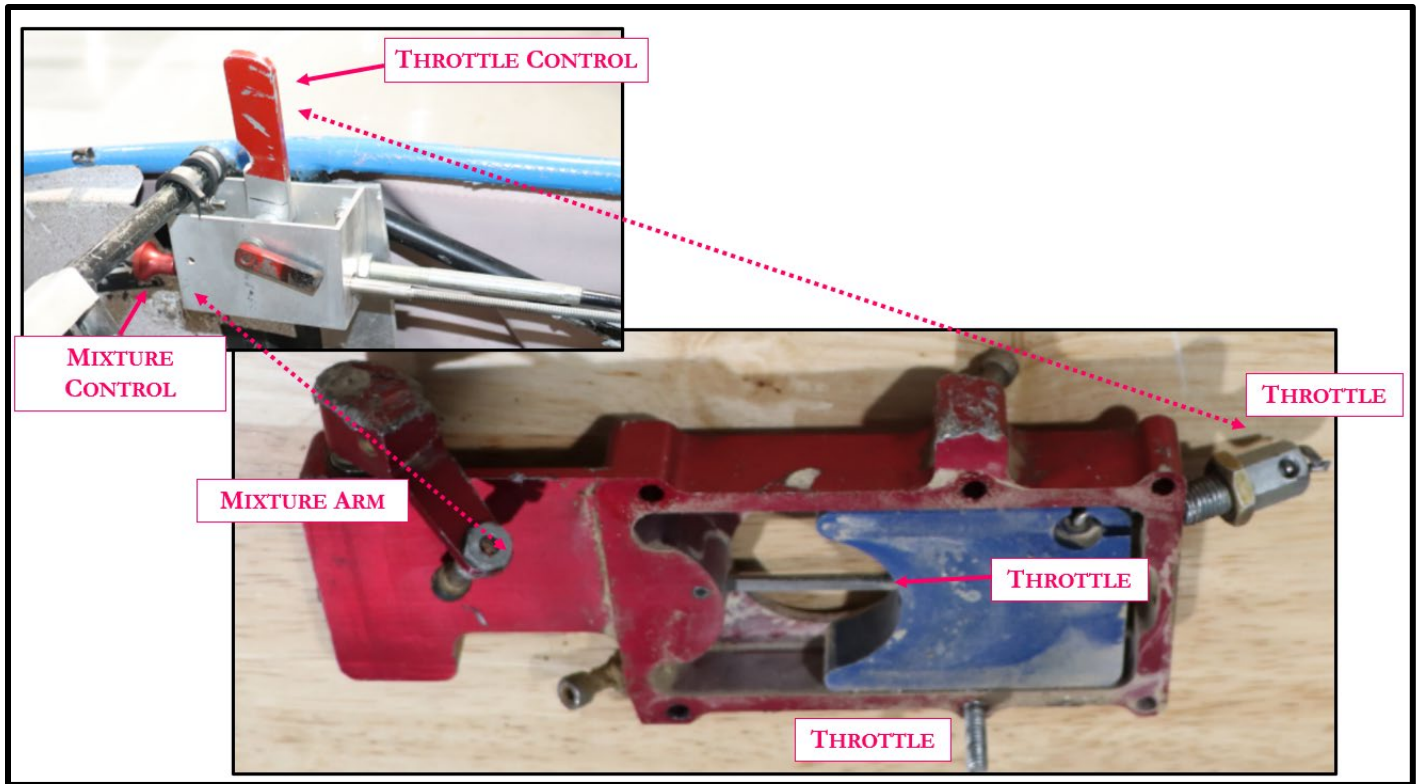


Figure 4: Throttle Body

The fuel shutoff valve was in between the off and on position. Investigators applied air pressure to the inlet which resulted in air pressure to partially escape to the outlet. The push-pull control to the valve was disconnected from its respective cable. It could not be confirmed if the damage to the control or position of the valve was changed during impact because fuselage structure was bent and compromised the cable.

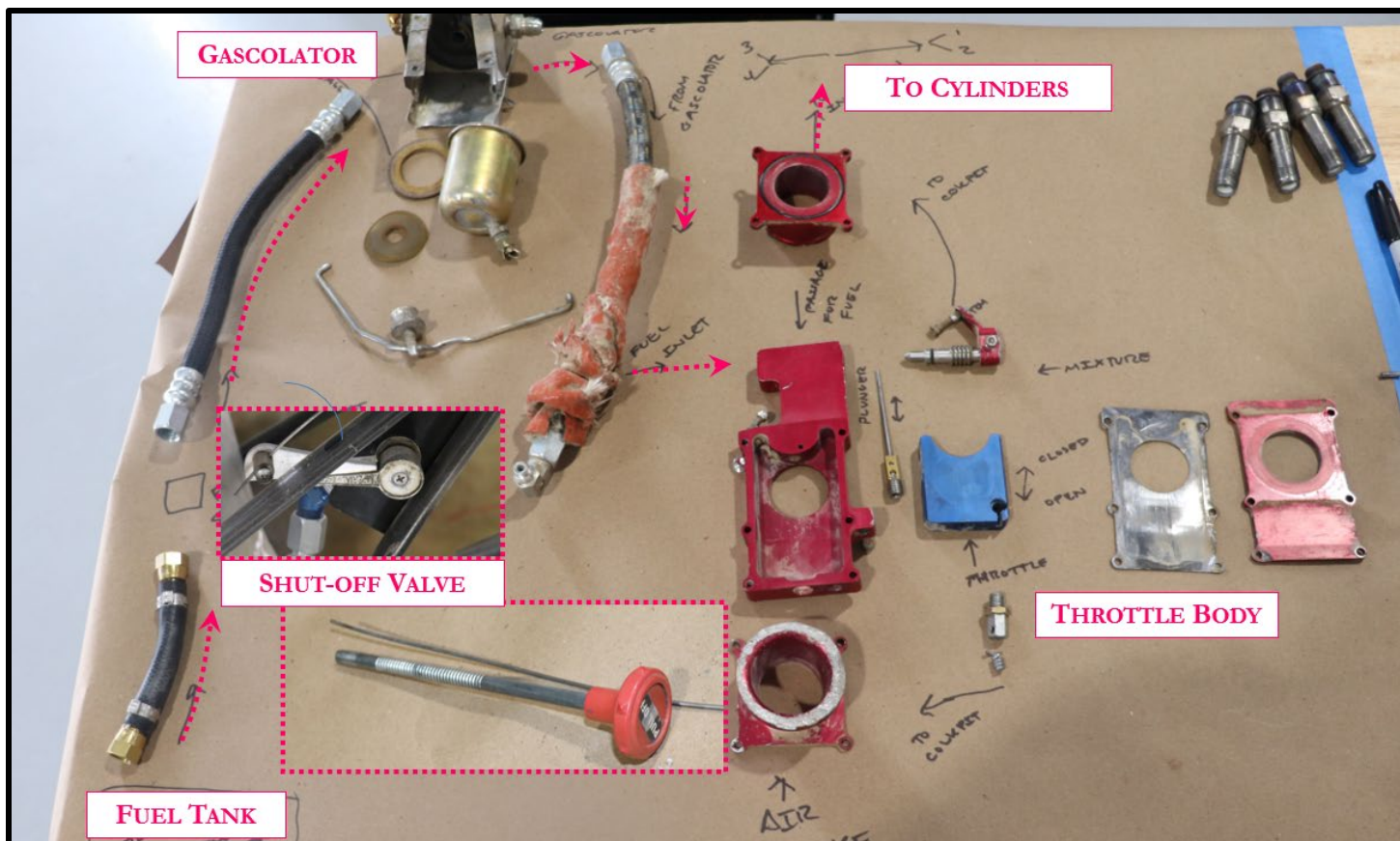


Figure 5: Fuel System Examination (showing fuel shut-off handle disconnected)

ENGINE

The engine was a HAPI 60-2DM¹, which was Volkswagen auto engine converted to full VW aircraft engines by Homebuilt Aircraft Products, Inc. (H.A.P.I.). It was a four-cylinder 60 horsepower engine with dual ignition. The tachometer shoed 942.6 hours.

During a post-accident examination, investigators achieved manual rotation of the crankshaft by rotation of the remaining propeller blades. Valve train continuity was observed, with equal lift action at each rocker assembly; oil was found in the rocker box areas on all cylinders. Investigators removed the upper spark plugs of all cylinders; they were light gray/white in color, consistent to lean to normal engine operation. A borescope examination of the cylinders revealed no foreign object damage, no evidence of detonation, and no indication of excessive oil consumption. The exhaust manifold pipes should white residue consistent with a lean mixture. The magneto timing was consistent with normal operation.

¹ <http://www.enginehistory.org/Piston/HOAE/HAPI.html>



Figure 6: Spark Plugs

The upper spark plugs were reattached to their respective lead and rotation of the crankshaft resulted in a visible spark at each plug; the impulse coupling was audible during rotations.

ADDITIONAL INFORMATION

According to the Sonerai instructions:

Fuel Line Installation

The fuel line must flow smoothly from the gascolator to the AeroInjector, with no part of the fuel hose rising higher than the carburetor fuel inlet. If the hose is higher than the fuel inlet at any point between the gascolator and the AeroInjector, an air pocket can form and hinder fuel flow.

The use of 3/8" I.D. (-06 hose) stainless steel reinforced fuel line, such as Pro-Flex brand hose from Jegs, with AN hose fittings is recommended. **Do not use barbed hose fittings and hose clamps in the fuel system.**

Important. Never use teflon tape on any fuel system connections as it may block fuel flow.

CONTACT INFORMATION

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