

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA220

FOLLOW UP EXAMINATION SUMMARY

July 21, 2023

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A. ACCIDENT

Location: Nephi, Utah
Date: 6/8/2023
Time: 12:19 Mountain daylight time
Airplane: N7318Y

B. FOLLOW UP EXAMINATION SUMMARY

IIC	Eleazar Nepomuceno National Transportation Safety Board Federal Way, Washington
Party Coordinator	Katheryn Whitaker Piper Aircraft, Inc Phoenix, Arizona

C. SUMMARY

On June 8, 2023, about 1219 Mountain daylight time, a Piper PA-30, N7318Y, was substantially damaged when it was involved in an accident near Nephi, Utah. 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 he departed Cedar City Regional Airport (CDC), Cedar City, Utah, to relocate the airplane to Skypark Airport (BTF), Bountiful, Utah, for an annual inspection. While in cruise flight, about 9,500 msl, the left engine decreased from 2,400 rpm to 1,000 rpm briefly and increased back to 2,400 rpm. The pilot attempted to troubleshoot the left engine, however, it continued to cycle sporadically between 1,000 and 2,400 rpm. The pilot diverted to the Nephi Regional Airport (U14), Nephi, and initiated a straight in approach to runway 17.

During the landing flare, about 5 feet above the runway, the left engine lost all power. The pilot immediately applied the right rudder to counteract the lowered left wing, however, the airplane touched down and exited the left side of the runway. Subsequently, the airplane impacted a dirt mound and came to a rest in an open field, which resulted in substantial damage to the right wing.

D. DETAILS OF THE EXAMINATION

The examination of the fuel system took place on July 19, 2023, at Air Transport in Phoenix, AZ.

1.0 Airframe Examination

1.1 Fuselage

The aircraft had been disassembled, including the removal of both wings at the wing roots, and removal of both sides of the stabilator. During examination, the fuselage was propped up on stands. The fuselage sustained minor damage from the accident sequence (figure 1).



Figure 1. View of accident airplane at wreckage layout

1.2 Empennage

The empennage was not impact damaged. Continuity was confirmed from the flight control surface to the cockpit controls.

1.3 Wings

The left wing had been removed from the fuselage at the wing root and was generally unremarkable in appearance. The fuel caps for the main and aux tanks remained within their respective fillers. No fuel was seen within the tanks. The tip tank had been removed from the wing and appeared undamaged.

The right wing had been removed from the fuselage at the wing root and was displayed a positive bend at about Wing Station 143. The fuel caps for the main and aux tanks remained within their respective fillers. No fuel was seen within the tanks. The tip tank had been removed from the wing and appeared undamaged.

1.4 Cockpit

The instrument panel appeared undamaged. The electrical switches were all found in the off position. The left engine throttle lever was found positioned mid-travel. The remaining engine control levers were found positioned fully forward. Two STC-installed turbocharger control knobs were present below the engine control quadrant; the left knob was in the off (out) position, and the right knob was in an intermediate position.

The left fuel selector handle was found positioned to the left main fuel tank position. When sumped, no fuel was released from the bowl. The bowl was removed and debris consistent with rust and dirt was found at the bottom of the bowl and in the plastic filter. The left fuel selector valve assembly was removed and tested with low air pressure; no defects in operation were noted. Rust and debris were found in the left main fuel tank port.

The right fuel selector handle was found positioned to the right main fuel tank position. When sumped, about 3 ounces of rusty fuel was released from the bowl. The bowl was removed and debris consistent with rust and dirt was found at the bottom of the bowl and in the plastic filter. When the selector valve handle and arm were turned, binding was felt, and the valve could not be moved to the crossfeed or off positions.

1.5 Fuel/Fuel System

1.5.1 Fuel System Description (figure 2)

The fuel is carried in four integral fuel cells located in the leading-edge sections of the wings. The capacity of the two main fuel cells is 30 gallons each of which 27 gallons is usable. The auxiliary fuel system consists of two 15-gallon cells (all usable) installed in the wings just outboard on the main fuel cells. The installed wing tip tanks hold a capacity of 15 gallons each.

For each engine, fuel is taken from each cell through a screen located in the cell outlet fitting and then on to a shut-off selector valve. From the selector valve, fuel is drawn through an electrically operated auxiliary fuel pump and on to an engine

driven pump where it is pumped to the injector unit. Fuel from the tip tanks enters the auxiliary fuel line at the solenoid valve located in the cabin at the main spar.

During normal operation use the engine driven fuel pump to draw fuel from the cell directly adjacent to that engine. However, fuel can be drawn from any cell to both engines using the engine driven fuel pump or the electric auxiliary fuel pump. For emergency single engine operation, a crossfeed is provided to increase the range.

When using fuel from cells on the opposite side of the operating engine, move the fuel selector for the inoperative engine to the main or auxiliary position; then move the fuel selector for the operating engine to the crossfeed position. For single engine landing, fuel must be pumped from the main cell on the same side as the operating engine.

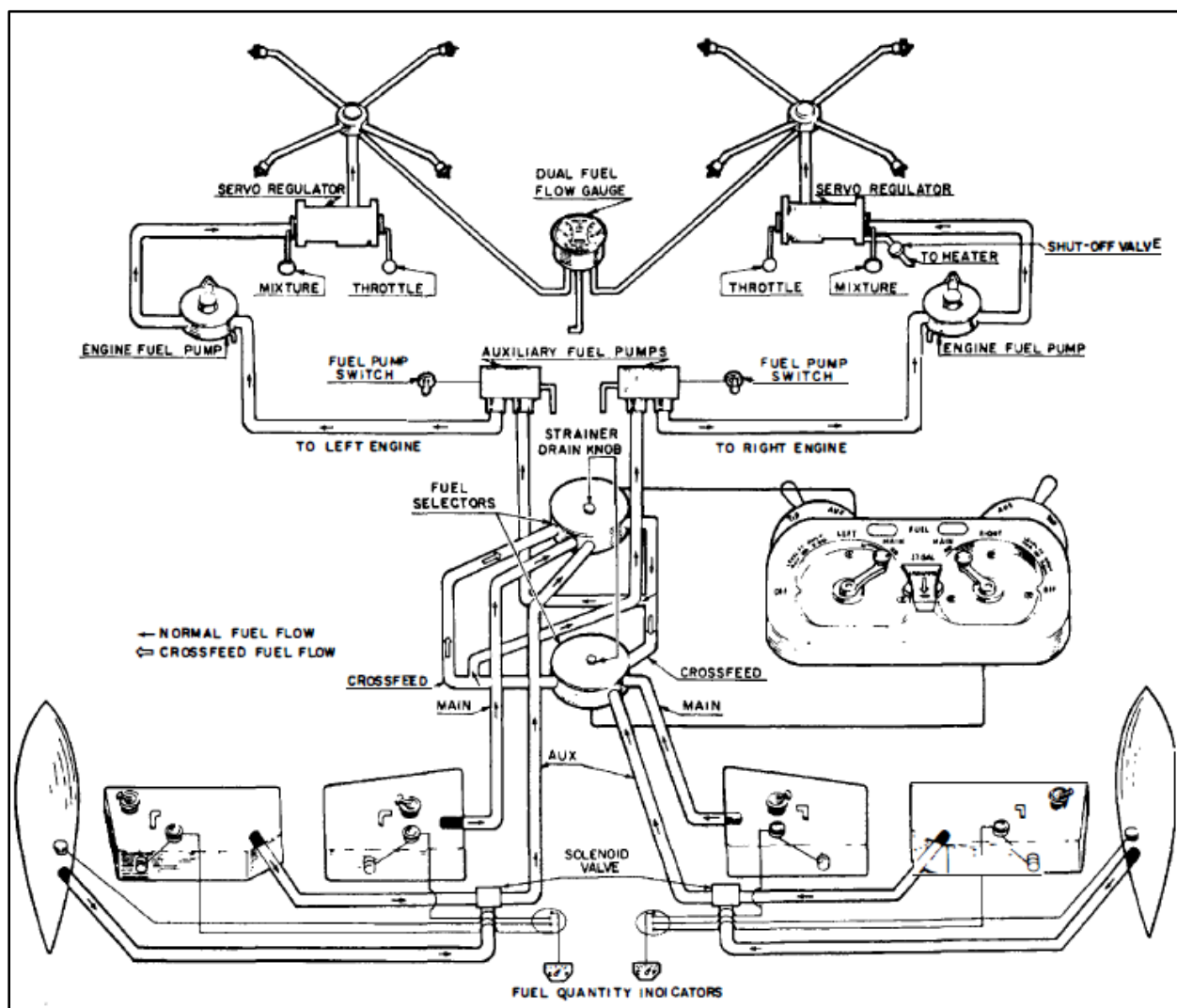


Figure 2. Fuel schematic diagram

1.5.2 Fuel Selector Valve and Strainer Assemblies' Description & Exam

The left and right fuel selector valve and strainer assembly for the fuel system are located beneath the floor panel in the center section of the fuselage. Daily draining of the strainers may be accomplished in the cockpit by opening the hinged access door located in the floor panel just aft of the fuel selector handles and pulling up on the knob located in the center of the selector valve. The general procedure for draining the fuel system is to open the strainer quick drain for several seconds with the fuel cell selector on the main cell, then to change the selector to the auxiliary cell and repeat the process. Allow enough fuel flow to clear the lines as well as the strainer. Positive fuel flow shut off can be observed through the clear plastic tube that carries the fuel overboard. Located inside the fuel valves is a bypass valve which will open at 1/2 psi differential pressure if the strainer screen becomes blocked.

Fuel strained from the right strainer was tested with Sar-gel and revealed no water contamination. Removal of both the left and right fuel strainer bowls and filter discs revealed that the filter bowl and filter disc had contaminants consistent with rust/corrosion.

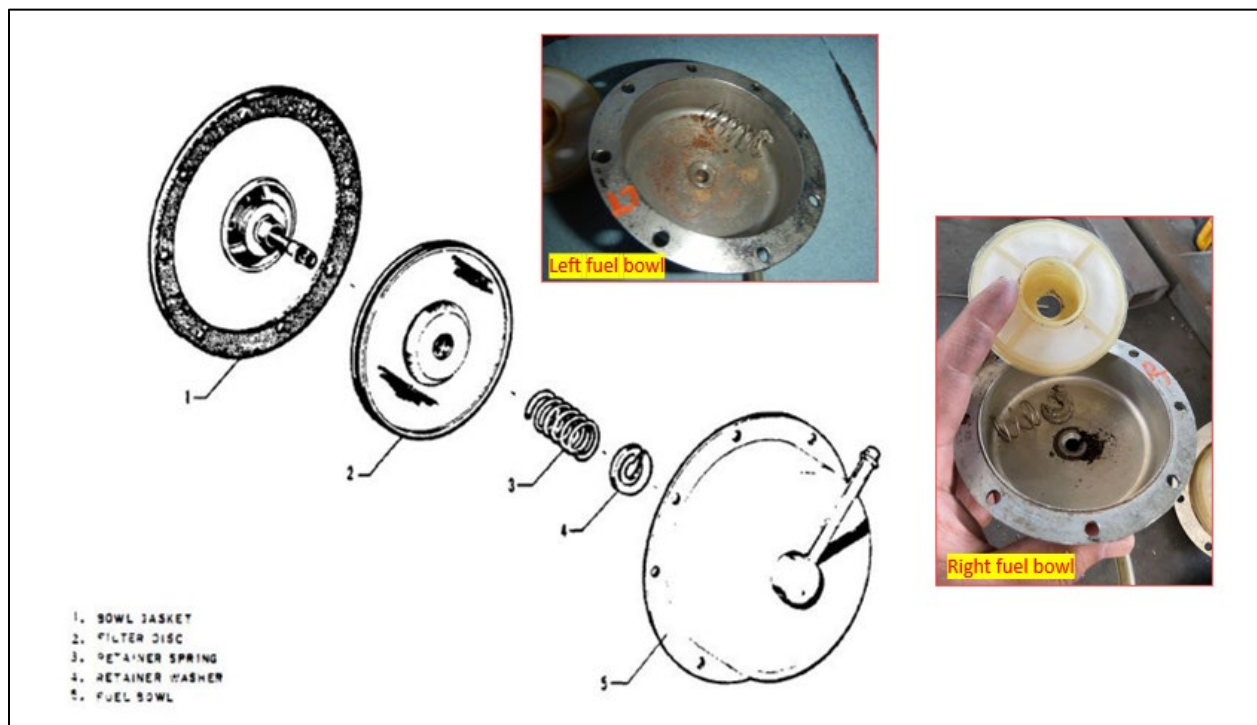


Figure 3. Diagram of fuel filter bowl assembly with 2 embedded photos of the left and right fuel bowl disassembled

The left and right fuel strainer knob assembly was removed, and corrosion was found in the cavity walls and cover plate. The left and right fuel selector valves were removed from the airframe and corrosion was found in the threads of the left and right fuel line auxiliary outlet unions (see figure 4).

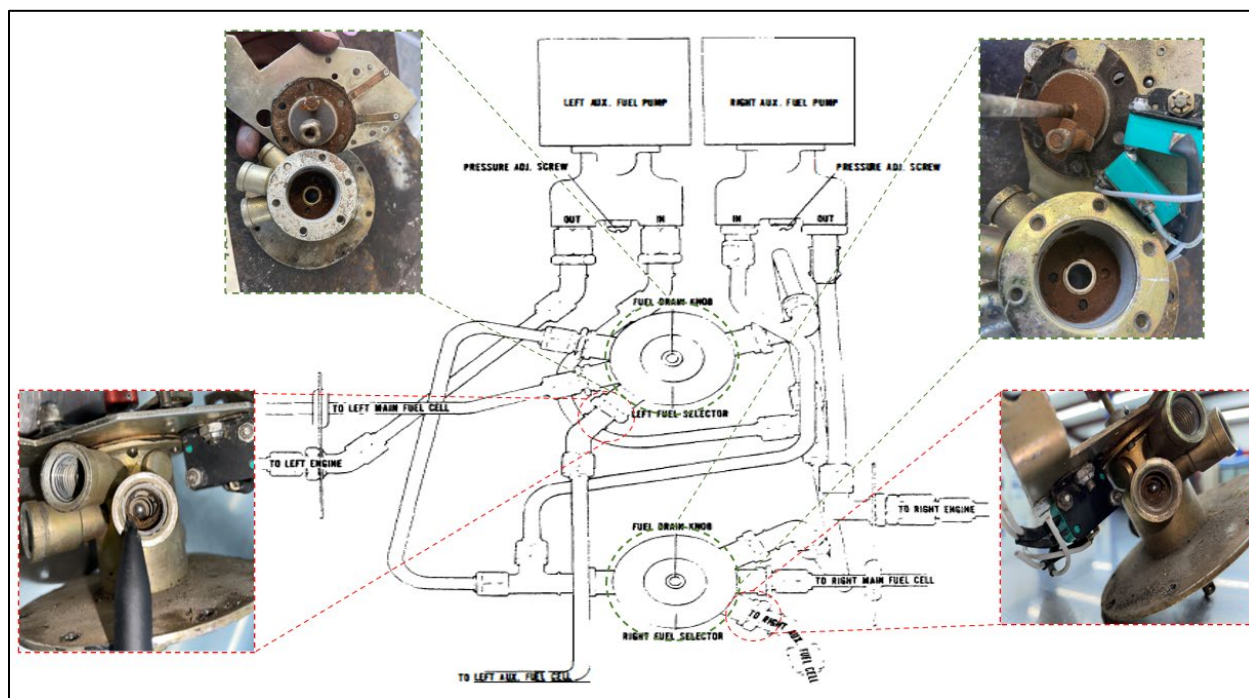


Figure 4. View of fuel selector valve diagram with embedded photos of removed left and right valves

Examination of the fuel pump revealed no mechanical anomalies. Collected fuel by the recovery company was tested with Sar-gel and revealed no water contamination.

2.0 Engine Examination

The following examination observations apply to both the left and right engine that was separated from the firewall:

All four cylinders and all engine accessories remained attached. All fuel and oil lines that were removed were tight. No evidence of any mechanical damage was observed to the engine crankcase.

The rocker box covers were removed. The intake and exhaust rocker arms were intact, and oil coated residue was seen in all cylinders. All intake and exhaust valve springs were in place and visually appeared to be undamaged. The upper spark plugs were removed, and all four cylinders were examined internally using a lighted borescope. A normal amount of combustion deposits was observed within the combustion dome of each cylinder and piston face. All the intake and exhaust valves were unremarkable. The crankshaft was rotated by hand using the propeller. Rotational continuity was established throughout the engine and valve train. Thumb compression and suction were obtained on all four cylinders.

The top engine spark plugs were removed from the engine, and they were the massive electrode type. The sparkplugs exhibited black deposits within the electrode

area. All spark plugs exhibited signatures consistent with NORMAL when compared to the Champion Check-A-Plug comparison chart.

The fuel servo remained attached to the engine and was unremarkable. The throttle and mixture control cable remained attached to the servo and unremarkable. The throttle and mixture control moved the available length. The fuel servo inlet screen was removed, and no debris was observed. The turbocharger remained attached and was undamaged. The fuel flow divider was intact and undamaged. Each fuel servo and fuel flow divider from each engine were recovered for further examination.

3.0 Propeller Examination

The right propeller hub and blade assembly sustained damage to each blade tip. The spinner was unremarkable. One blade had aft curling, and the other blade tip had chordwise scratching. The right propeller hub and blade assembly sustained minor gouges to the outboard leading edge.

4.0 Aircraft Information (see figures 5 & 6)

According to the engine logbook entries from February 2, 2023, about 4 months prior to the accident flight, the engine had a loss of power in flight. Troubleshooting found a restricted fuel screen and corrosion. The airframe and powerplant technician replaced both fuel screens and gaskets with new. He further replaced the right had outboard auxiliary tank fuel line, flushed the fuel lines, and cleaned all fuel nozzles. The left engine's fuel nozzles were cleaned, and the fuel lines were flushed.

ENGINE LOG		
N7318Y	TACH: H: 169.2	AFTT:
	ETT: TSMOH:	PTT:
	REPLACED ALL SPARK PLUGS PN UREB37E WITH NEW CLEANED ALL FUEL NOZZLES AND REINSTALL. FLUSHED FUEL LINES IAW COMANCHE SERVICE MANUAL. RESET MAGNETO TIMING TO 25 DEG PER DATA PLATE.	
2/6/2023	ENGINE LOG LH	

Figure 5. Excerpt of left engine maintenance logbook entry

ENGINE LOG		
N7318Y	TACH: H: 169.2	AFTT:
	ETT: TSMOH:	PTT:
	LOSS OF POWER TO RH ENGINE IN FLIGHT, FOUND RESTRICTED FUEL SCREEN AND CORROSION. REPLACED FUEL LINE RH OUTBOARD AUX TANK. REPLACED BOTH FUEL SCREENS (754-816) AND GASKETS (751-871) WITH NEW. FLUSHED FUEL LINES IAW COMANCHE SERVICE MANUAL.	
	END	
2/6/2023	AIRFRAME LOG	

ENGINE LOG		
N7318Y	TACH: H: 169.2	AFTT:
	ETT: TSMOH:	PTT:
	REPLACED 5 SPARK PLUGS P/N UREB37E RH ENGINE. CLEAN ALL FUEL NOZZLES AND REINSTALL. RESET MAGNETO TIMING TO 25 DEG PER DATA PLATE FOR ENGINE.	
	END	
	1	
2/6/2023	ENGINE LOG RH	

Figure 6. Excerpt of right engine maintenance logbook entry

Submitted by:

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