Aviation Investigation Final Report

Location:	Needles, California	**Accident Number:**	WPR13LA272
Date & Time:	June 15, 2013, 18:00 Local	**Registration:**	N9370B
Aircraft:	Cessna 175	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Serious, 2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a personal cross-country flight with three passengers on board. The pilot reported that, during cruise flight, the engine began to "sputter" and subsequently lost power. As the airplane began to descend, the pilot began to set it up for best glide airspeed to initiate an emergency landing. The airplane subsequently impacted desert terrain short of the intended landing site.

Postaccident examination of the airframe, engine, and fuel system revealed no anomalies that would have precluded normal operation. First responders reported seeing no visible signs of fuel nor smelling fuel around the airplane. Further, wreckage recovery personnel reported that there was no fuel in the fuel system. The pilot did not provide a statement about the airplane's fuel quantity at the time of departure; however, the evidence indicates that fuel exhaustion caused the loss of engine power.

The investigation revealed that, although the airplane was manufactured with four seats, the airplane was only equipped with three seats: the pilot seat, the front passenger seat, and the rear passenger seat. Therefore, there were more passengers than available seats, which led to an adult and a child older than 2 years being seated together in the front passenger seat and sharing the seatbelt. According to federal regulations, an approved safety belt with an approved metal-to-metal latching device is required for each occupant 2 years of age or older; the adult passenger sustained serious injuries, likely because she was sharing the seat with the child. The rear seat, which was occupied by one passenger, was attached to the floor via a "homemade" mounting frame constructed with a welded hollow pipe structure that had mounting points to attach the seat; this structure failed during the impact sequence, which resulted in the passenger sustaining serious injuries. No approval paperwork for the modified seat installation was found during the investigation.

Probable Cause and Findings

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

A loss of engine power due to fuel exhaustion as a result of the pilot's inadequate fuel planning. Contributing to the severity of the front passenger's injuries was the pilot's decision to depart with more passengers than available seats, which resulted in an adult and a child passenger sharing a seatbelt. Contributing to the severity of the rear passenger's injuries was the failure of the unapproved modified seat installation.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot
Personnel issues	Modification/alteration - Pilot
Aircraft	Seat/cargo attach fitting - Failure
Aircraft	(general) - Not installed/available
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Emergency descent	Loss of engine power (total)
Landing	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On June 15, 2013, about 1800 Pacific daylight time, a single-engine Cessna 175 airplane, N9370B, experienced a loss of engine power during cruise flight, and made a forced landing in a Bureau of Land Management (BLM) Wilderness Area, in Needles, California. The private pilot owned and operated the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91, as a business flight. The pilot and one passenger received minor injuries; two additional passengers received serious injuries. The airplane sustained structural damage throughout the fuselage. Visual meteorological conditions prevailed for the flight that departed the Tehachapi Municipal Airport (TSP), Tehachapi, California, about 1530, and was destined for Ernest A. Love Field Airport (PRC), Prescott, Arizona. No flight plan had been filed.

The investigation noted that two of the passengers, one adult and one child, were seated in the front right, and shared a seat belt. The adult passenger sustained serious injuries. The other adult (non-pilot) was seated in the rear left seat. Both the adult passengers; one seated in the front right, and the other seated in the left rear seat sustained serious injuries. The rear seated passengers' seat frame fractured into multiple pieces during the accident sequence.

According to the responding law enforcement officers who interviewed the pilot, the pilot reported that at an altitude of 8,000 feet mean sea level (msl), and about 15 miles southwest of the Laughlin-Bullhead Airport, the airplane's engine began to "sputter" followed by a loss of power. The pilot stated that he began to set the airplane up for best glide to initiate an emergency landing, when the passenger in the front right seat pushed forward on the yoke, and caused the airplane to impact terrain short of the intended landing site. After the impact, the pilot reported shutting off electrical switches, and draining about 15 gallons of fuel from the airplane's fuel tanks to reduce the risk of fire.

Law enforcement noted in their on site investigation and interview with the pilot, that only one of the propeller blades sustained bending damage and the other blade was undamaged. Law enforcement also reported that there were no signs that fuel was drained from the airplane after the impact. The pilot reported to law enforcement that a fourth seat was folded up in the back of the airplane. No such seat was observed by law enforcement. No provisions for attaching a fourth seat were observed on the oval frame. During the on scene investigation by law enforcement, it was also noted that the pilot had slurred speech, bloodshot eyes, was argumentative, and refused to answer questions. Due to the nature of the pilot's injuries, law enforcement did not perform a sobriety test on the pilot.

According to the rear seated passenger, he knew the pilot from previous business transactions, and the pilot had offered to fly him and his wife to Tehachapi to pick up their child from camp, and then fly them back home to Prescott. After everyone had exited the airplane, the pilot called for help using the passengers' cellphone. The passenger overheard the pilot stating to the 911 dispatcher that he had drained fuel from the airplane; however, the passenger did not witness the pilot drain fuel from the airplane.

The passengers were interviewed by the responding deputies. The adult passengers reported that after landing at the airport, they were met by the passengers' child and camp counselors. They traveled into town for lunch. After lunch, while on the way back to the airport, the group stopped at a Home Depot to purchase four red plastic gas cans. One of the passengers queried the pilot as to what the cans were for. The pilot told her that it was to purchase auto gasoline to save money. They stopped at a gas station where the pilot put gasoline into the containers. Upon arrival at the airport, the pilot and the male passenger fueled the airplane utilizing the contents of the four containers; the empty containers were placed into a garbage bag, and then placed somewhere in the airplane.

The front seat passenger reported that the pilot instructed her and her son to sit up front, and share the seatbelt. When the passenger asked why, the pilot told her it was for weight distribution. The passenger reported that she was concerned due to the proximity of the two to the flight controls; she also did not notice a fourth seat. She reported that the flight was uneventful until they got close to Laughlin, when the engine began to sputter and then quit; she knew it had quit because it had gotten quiet inside the airplane.

Both passengers reported that after the engine quit, the pilot stated that the fuel was contaminated with water.

PERSONNEL INFORMATION

The pilot, age 61, held a private pilot certificate with an airplane single-engine land rating. The pilot was denied a medical certificate on November 12, 2012. The investigation was not able to determine the pilot's total accumulated flight time; however, the pilot's logbook indicated the completion of a biennial flight review on May 19, 2013. The pilot did not return the NTSB Pilot Operator Report form 6120.1, which would have included his total flight time.

AIRCRAFT INFORMATION

The 1958 Cessna 175 had an airframe total time (TT) of 1,479.5 hours; it had been modified with a supplemental type certificate (STC – SA763GL) to accept auto fuel (the airplane's fuel filler caps were placarded as such). A logbook entry, dated February 2, 2011, indicated that the airplane/engine underwent an annual/100-hour inspection at a tachometer time of 1,925.2 hours, and an engine total time of 1,968.2 hours (584.2 hours since major overhaul – SMOH). An invoice dated January 21, 2013, indicated that at a tachometer time of 1,999.1 hours, the numbers three and four cylinders were removed to grind the valves and seats, and ream the guides. The engine's oil filter had a date of April 25, 2013, and a tachometer time of 2,013.7 hours written on the side. During the investigation examination, the tachometer's hour meter indicated 2,034.1 hours.

TESTS AND RESEARCH INFORMATION

A postaccident examination of the airframe and engine revealed no mechanical anomalies that would have precluded normal operation. The visual examination of the airplane revealed that it had been equipped with three seats; the airplane was manufactured with four seats. Seat numbers one and two, located in the front of the cockpit were attached to their respective mounting frames. Seat number three located in the left rear, was attached to the floor via a nonstandard mounting frame. Seat number four was not present. The mounting frame for the numbers three and four seats appeared to be homemade and constructed with hollow pipe welded together in an oval shape, with the mounting points attached for the seat. A review of the airplane's paperwork did not identify approval paperwork for the seat installation. The oval frame separated into multiple pieces. When the airplane was examined during the post-recovery examination, it was observed that there was no carpet installed in the back of the cabin, and a majority of the inspection panels had been removed.

Postaccident examination revealed that three of the four engine mounts were fractured (only the front right mount leg remained intact). The engine remained in place but was displaced nose down. The propeller spinner remained attached to the propeller, and sustained impact damage to one side. The fixed-pitch propeller remained attached to the propeller flange. One blade was bent aft about 90 degrees, and displayed spanwise scrapes and gouges on the blade camber. The other blade sustained little-to-no damage. Rotation of the propeller while attached to the propeller flange did not reveal any internal anomalies or binding within the propeller reduction gear housing.

The carburetor was separated from the engine, and its mounting flange was fractured. The mixture and throttle controls were separated from the carburetor. The mixture control lever was fractured, and was not observed. The throttle control lever and rod end remained attached to the carburetor; movement of throttle control lever had a corresponding movement of the throttle valve. The carburetor remained attached to the air intake; however, it was separated from the induction system at its mounting flange aft of the oil sump. The throttle valve was unobstructed, and free to move throughout its entire range. The left side induction elbow sustained crushing damage. The carburetor inlet fuel screen was clear and there was no sediment noted in the bowl. The metallic floats were intact, and there was no binding noted in the float pivot/fuel inlet. None of the discharge valves appeared to be obstructed. Rotation of the mixture control shaft revealed no evidence of binding. The throttle control lever remained attached to the carburetor, and the control cable's rod end remained attached to the lever.

There were no external signs of operational distress on any of the engine components. The left side exhaust muffler was separated from the numbers four and six exhaust risers, and the exhaust muffler sustained some denting damage. The right side exhaust muffler remained attached to the exhaust risers on the odd side of the engine. The left side intake manifold from the oil sump to the even cylinders was crushed.

The oil sump was intact, and the remote mounted oil filter was in place and safety-wired. There was a dark discoloration along the top spine of the engine as well as the front-top of the reduction gear housing. No other external anomalies were noted. The oil sump was intact, the filler neck and cap were intact, and the dipstick was in place. Removal of the dipstick with the front of the engine in a nose-low position revealed 5.5 quarts of oil registered on the stick. Removal of the oil filter revealed oil was present in the oil filter supply and return lines, and the oil filter was filled with oil.

The ignition switch inside the cockpit was positioned to BOTH, and the key was broken. The magnetos remained in place and intact on the backside of the engine. The ignition harnesses were intact, and each

ignition lead remained attached to its respective sparkplug. The sparkplugs were in place and secured to their respective cylinders. The ignition leads for the top sparkplugs were removed from the cylinders. The sparkplugs displayed a normal-worn appearance, and displayed light beaded deposits consistent with combustion by-product when compared to the Champion Aviation Service Manual AV6-R. A borescope inspection of the cylinders was conducted; the sparkplugs were reattached to their respective ignition leads. The propeller was rotated and an audible snap was heard from the impulse coupling. A spark was observed from each of the top sparkplugs in the firing order dictated on the crankcase and the overhaul manual. The magneto-to-engine timing was checked, and found to be set at approximately 28 degrees before top-dead-center with the points opening within +/- 1 degree of each other.

The crankcase remained intact with the propeller reduction gear housing remaining intact and in place. There were dark discolorations of the top spine of the crankcase and the top front propeller reduction gear housing (between and aft of the left and right cage sections). The propeller driveshaft and crankshaft were not visually examined; however, rotation of the propeller while it was attached to the propeller flange resulted in continuity through to the back of the engine (as noted with the functional operation of the magnetos, the valve train, and pistons). The camshaft was not visually examined; however, rotation of the propeller while it was attached to the propeller flange resulted in continuity through the valve train to each of the cylinders. All six cylinders remained attached to the crankcase, and none of the cylinders showed any signs of pre-accident anomalies.

ADDITIONAL INFORMATION

According to 14 CFR 91.205 an approved safety belt with an approved metal-to-metal latching device for each occupant 2 years of age or older is required.

Recovery personnel did not recovery any fuel from the airplane at the accident site.

Pilot Information

Certificate:	Private	**Age:**	61,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None None	**Last FAA Medical Exam:**	November 12, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9370B
Model/Series:	175	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	55170
Landing Gear Type:		**Seats:**	4
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	GO-300 SERIES
Registered Owner:	Registration Pending	**Rated Power:**	175 Horsepower
Operator:	Registration Pending	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EED,983 ft msl	**Distance from Accident Site:**	
Observation Time:	17:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / 17 knots	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	41°C / -12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tehachapi, CA (TSP)	**Type of Flight Plan Filed:**	None
Destination:	Prescott, AZ (PRC)	**Type of Clearance:**	None
Departure Time:	15:30 Local	**Type of Airspace:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Serious, 1 Minor	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 2 Minor	**Latitude, Longitude:**	34.780147,-114.590049(est)

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	John Waugh; Federal Aviation Administration; Las Vegas, NV
Original Publish Date:	June 29, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87202