



Aviation Investigation Final Report

Location:	Tooele, Utah	Accident Number:	WPR10LA210
Date & Time:	April 20, 2010, 19:00 Local	Registration:	N331GP
Aircraft:	Piper PA-44-180	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

Prior to starting the before-takeoff checklist in preparation for the instructional flight in the twin-engine airplane, the private pilot-rated student performed the required engine/fuel tank cross-feed check. At the completion of that check, she inadvertently forgot to reposition the right engine fuel selector to the "ON" position, but instead left it in "Cross-Feed." Therefore, as the flight progressed with both engines using fuel from the left tank, it ultimately led to the consumption of all usable full in that tank. Therefore, the left engine lost all power during the initial climb after takeoff from a practice short-field landing. When the engine lost power, the student realized the right engine fuel selector was in "Cross-feed" and repositioned it to the "ON" position, but did not advise the flight instructor that she had done so. The flight instructor, who took control of the airplane after the loss of power, was unable to get the left propeller to fully feather due to the low oil pressure created by the low engine rpm. He therefore decided to attempt to turn back to the airport, but in doing so turned left (into the failed engine), and the airplane therefore began to descend at a rate that made it unlikely that he could safely reach the runway. He therefore landed in a nearby open field, whereupon the airplane encountered rough terrain and experienced a collapse of the left main landing gear. The commercially produced expanded checklist that the student was using did not have an added step in the "Before-Takeoff" section calling for a recheck of the fuel valves in the "ON" position. The expanded checklist produced by the airplane's operator did have such a step, but the operator did not have a written policy requiring the use of their checklist.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The complete loss of power in one engine due to fuel starvation as a result of the pilot's failure to reposition the cross-feed valve prior to takeoff and the flight instructor's failure to monitor

the pilot's actions. Contributing to the accident was the instructor pilot's failure to monitor the fuel level during the flight and his decision to turn left (into the failed engine) after the loss of power.

Findings

Aircraft	Fuel selector/shutoff valve - Incorrect use/operation
Personnel issues	Forgotten action/omission - Pilot
Personnel issues	Monitoring other person - Instructor/check pilot
Personnel issues	Monitoring equip/instruments - Instructor/check pilot
Personnel issues	Incorrect action selection - Instructor/check pilot
Aircraft	Fuel - Fluid management

Factual Information

History of Flight

Standing-engine(s) operating	Miscellaneous/other
Initial climb	Fuel starvation
Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Landing gear collapse

On April 20, 2010, about 1900 mountain daylight time, a Piper PA-44-180, N331GP, experienced a gear collapse during a forced landing about two miles southeast of Tooele Valley Airport, Tooele, Utah. The certified flight instructor was not injured, but his private pilot-rated student received minor injuries. The airplane, which was operated by Leading Edge Aviation, sustained substantial damage to both its fuselage and wings. The 14 Code of Federal Regulation Pat 91 instructional flight departed Salt Lake City International Airport about 60 minutes prior to the accident. The flight was being operated in visual meteorological conditions. No flight plan had been filed.

According to the flight instructor, after departing the Salt Lake City area the student executed a simulated engine-out instrument landing system (ILS) approach to Tooele Valley Airport. During that approach the right engine was set at idle. At the completion of that approach, a touch-and-go landing was performed with both engines being brought up to full power during the takeoff. The student then stayed in the VFR (visual flight rules) pattern, and performed a short field landing using both engines, followed by a normal takeoff using both engines. During the initial climb, as the airplane reached a height of about 200 to 300 feet above ground level (agl), it suddenly lost all power in the left engine. At that time the flight instructor took control of the airplane, confirmed that the left engine had lost all power, checked the position of the fuel selector valves, and then attempted to feather the left engine. The left engine did not fully feather due to insufficient oil pressure as a result of the low engine rpm, and soon thereafter the instructor pilot turned to the left in an attempt to get back around to the airport. After he initiated the turn to the left (into the power-out engine) the airplane started to descend, and it became obvious to the instructor that the airplane was losing altitude too quickly for him to safely maneuver back around to the airport. He therefore picked out an area for a forced landing and headed toward that location. While he was about 50 feet in the air he lowered the landing gear, but he left the flaps in the full up position. Although the touchdown was successful, during the landing roll the airplane encountered rough terrain that resulted in the collapse of the left main landing gear.

Two days after the accident, the private pilot, who was receiving instruction in preparation for a multi-engine rating proficiency check, revealed that after performing the engine cross-feed check prior to departing Salt Lake International Airport, she had inadvertently forgotten to

correctly reposition the right fuel selector to the "ON" position. The result of that omission created a situation where both engines were feeding off of the left fuel tank (right engine in cross-feed). She further stated that when the left engine lost power during the initial climb, she noticed the incorrect fuel selector position, and reset it to the "ON" position so that the right engine was feeding off of the right fuel tank.

She further stated that she did not mention the repositioning of the fuel selector valve to the flight instructor during the accident sequence, and therefore when he checked the position of the fuel selectors after taking control of the airplane, he had no idea that the selector had been incorrectly positioned and then repositioned. In a phone conversation with the NTSB Investigator-In-Charge, the flight instructor said he had not noticed the incorrectly positioned fuel selector, and neither he nor the private pilot noticed the unequal fuel tank quantity that developed as the flight progressed.

The investigation also revealed that the private pilot was using an expanded checklist produced by CheckMate Aviation Inc., instead of the expanded checklist produced by Leading Edge Aviation (the operator). A review of those two checklists revealed that both were expanded to include items/steps beyond those found in the Pilot's Operating Handbook (POH) provided by the airplane's manufacturer. Both checklists called for the cross-feed check to be completed prior to the initiation of the Before-Takeoff portion of the checklist, but only the Leading Edge Aviation version included an extra step in the Before-Takeoff section that called for the pilot to recheck that the fuel selector valves had been reset in the "ON" position (as opposed to still in cross-feed).

A further discussion with Leading Edge Aviation personnel revealed that although it was expected that instructor pilots, students, and renters would use the Leading Edge Aviation checklist, there was no written policy that required them to do so.

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	30,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	October 30, 2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	August 21, 2008
Flight Time:	2207 hours (Total, all aircraft), 127 hours (Total, this make and model), 2108 hours (Pilot In Command, all aircraft), 174 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Private	Age:	29,Female
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	January 5, 2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	November 8, 2008
Flight Time:	268 hours (Total, all aircraft), 34 hours (Total, this make and model), 20 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N331GP
Model/Series:	PA-44-180	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	44-7995277
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	March 24, 2010 100 hour	Certified Max Gross Wt.:	3800 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	6908 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	Installed, not activated	Engine Model/Series:	O-360-E1A6D
Registered Owner:	LOGAN AIR SERVICES LLC	Rated Power:	180 Horsepower
Operator:	Leading Edge Aviation	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Few / 5500 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 20000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	14 knots / 23 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.6 inches Hg	Temperature/Dew Point:	23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Salt Lake City, UT (KSLC)	Type of Flight Plan Filed:	None
Destination:	Salt Lake City, UT (KSLC)	Type of Clearance:	None
Departure Time:	18:00 Local	Type of Airspace:	

Airport Information

Airport:	Tooele Valley KTVY	Runway Surface Type:	
Airport Elevation:	4321 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor, 1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 1 None	Latitude, Longitude:	40.595275,-112.33889(est)

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	Tanya Glines; Salt Lake FSDO; Salt Lake City, UT
Original Publish Date:	August 12, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=75804

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