

National Transportation Safety Board
Washington, DC 20594

Brief of Accident

Adopted 01/26/1999

LAX98FA008
File No. 1406 10/12/1997 PACIFIC GROVE, CA Aircraft Reg No. N555JD Time (Local): 17:28 PDT

Make/Model: ADRIAN DAVIS / LONG-EZ
Engine Make/Model: Lycoming / O-320-E3D
Aircraft Damage: Destroyed
Number of Engines: 1
Operating Certificate(s): None
Type of Flight Operation: Personal
Reg. Flight Conducted Under: Part 91: General Aviation

	Fatal	Serious	Minor/None
Crew	1	0	0
Pass	0	0	0

Last Depart. Point: MONTEREY , CA
Destination: Local Flight
Airport Proximity: Off Airport/Airstrip

Condition of Light: Day
Weather Info Src: Weather Observation Facility
Basic Weather: Visual Conditions
Lowest Ceiling: None
Visibility: 50.00 SM
Wind Dir/Speed: 300 / 005 Kts
Temperature (°C): 17
Obstr to Vision: None
Precipitation: None

Pilot-in-Command Age: 53

Flight Time (Hours)

Certificate(s)/Rating(s)
Private; Multi-engine Land; Single-engine Land; Single-engine Sea; Glider
Instrument Ratings
Airplane

Total All Aircraft: 2750
Last 90 Days: Unk/Nr
Total Make/Model: 2
Total Instrument Time: UnK/Nr

The pilot had recently purchased the experimental, amateur-built Long-EZ airplane, which had a fuel system that differed from the designer's plans. The original builder had modified the fuel system by relocating the fuel selector handle from a position between the front pilot's legs to a position behind & above his (or her) left shoulder. There were no markings for the operating positions of the fuel selector handle, which were up (for off), down (for the right tank), and to the right (for the left tank). This deviation from the original design plans did not require FAA approval, nor did it require a placard to indicate such change from the original design. On 10/11/97 at Santa Maria, CA, the pilot received a 1/2-hour flight and ground checkout in the airplane by another Long-EZ pilot. The checkout pilot reported that the pilot needed a seatback cushion to be in position to reach the rudder pedals, and that he had difficulty reaching the fuel selector handle while seated with the cushion added. The pilot then departed on a 1-hour flight to his home base at Monterey with an estimated 12.5 gallons of fuel in the right tank & 6.5 gallons in the left tank. The checkout pilot estimated about 9 gallons of fuel were needed for the flight, and he noted the fuel selector was positioned to the right tank before departure. On 10/12/97 (the next day), a maintenance technician assisted the pilot in preparing for another flight. During preflight, the pilot was not observed to visually check the fuel. The technician noted that when the pilot was seated in the airplane, he had difficulty reaching the fuel selector handle. Also, he gave the pilot a mirror to look over his shoulder to see the unmarked, non-linear, fuel sight gauges, which were located in the rear cockpit. The technician estimated the available fuel and advised the pilot that the left tank indicated less than 1/4 full and that the right tank indicated less than 1/2 full. He said his estimate was based on the assumption that the gauges were accurate and linear. The pilot declined an offer for additional fuel, saying he would only be airborne about 1 hour and did not need fuel. The technician observed that before the engine was started, the fuel selector handle was in a vertical position; however, he did not note whether it was up (off) or down (right tank). As the technician went to the hangar, he heard the engine start & run for a short

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time, then quit. He saw the pilot turn in the seat toward the fuel selector handle, then the pilot motioned with his hand that things were all right. The technician did not observe whether the pilot had repositioned the fuel selector. The pilot restarted the engine, taxied, took off, and performed three touch-and-go landings in a span of about 26 minutes, followed by a straight-out departure to the west. Ground witnesses saw the airplane in straight and level flight about 350 to 500 feet over a residential area, then they heard a reduction of engine noise. The airplane was seen to pitch slightly nose up; then it banked sharply to the right & descended nose first into the ocean. The major structural components of the airframe were found fragmented on the ocean floor near the engine, but no preimpact part failure was found. The fuel selector valve was found in an intermediate position, about 1/3 open between the engine feed line and the right tank, and about 2-4% open to the left tank. Tests using another engine showed that the engine could be operated at full power with the selector in the as-found position; however, when the cap was removed from the left port (simulating the effect of an empty left tank), fuel pressure dropped to less than 1/2; & within a few seconds, the engine lost power. Conditions were simulated using another Long-EZ to evaluate the maneuver required to switch tanks from the front seat. The simulation revealed that 4 actions were required to change the fuel selector in flight: 1) Remove pilot's hand from the control stick; 2) Loosen shoulder harness; 3) Rotate upper body to the extreme left to reach the fuel selector handle; & 4) Rotate the handle to a non-marked (not logically oriented) position. During the evaluation, investigators noted a natural reaction for the pilot's right foot to depress the right rudder pedal when turning in the seat to reach the fuel selector handle. With the right rudder depressed in flight, the airplane would pitch up slightly & bank to the right.

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: CRUISE

Findings

1. (F) FUEL SYSTEM,SELECTOR/VALVE
 2. (F) ACFT/EQUIP,INADEQUATE CONTROL LOCATION - OWNER/BUILDER
 3. (F) FUEL SYSTEM,SELECTOR/VALVE - UNMARKED
 4. (F) ENGINE INSTRUMENTS,FUEL QUANTITY GAGE - INADEQUATE
 5. (F) ENGINE INSTRUMENTS,FUEL QUANTITY GAGE - UNMARKED
 6. (C) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND
 7. (C) REFUELING - NOT PERFORMED - PILOT IN COMMAND
 8. (F) FUEL TANK SELECTOR POSITION - IMPROPER - PILOT IN COMMAND
 9. (C) FLUID,FUEL - STARVATION/EXHAUSTION
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

10. REMEDIAL ACTION - ATTEMPTED
 11. (C) RUDDER - INADVERTENT ACTIVATION - PILOT IN COMMAND
 12. (C) DIVERTED ATTENTION - PILOT IN COMMAND
 13. (F) INADEQUATE TRANSITION/UPGRADE TRAINING
 14. (F) LACK OF TOTAL EXPERIENCE IN TYPE OF AIRCRAFT - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

15. TERRAIN CONDITION - WATER

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this accident as follows.
the pilot's diversion of attention from the operation of the airplane and his inadvertent application of right rudder that resulted in the loss of airplane control while attempting to manipulate the fuel selector handle. Also, the Board determined that the pilot's inadequate preflight planning and preparation, specifically his failure to refuel the airplane, was causal. The Board determined that the builder's decision to locate the unmarked fuel selector handle in a hard-to-access position, unmarked fuel quantity sight gauges, inadequate transition training by the pilot, and his lack of total experience in this type of airplane were factors in the accident.