



Aviation Investigation Final Report

Location:	Antioch, California	Accident Number:	LAX06LA190
Date & Time:	June 3, 2006, 14:35 Local	Registration:	N117PS
Aircraft:	Aviat Aircraft Inc Pitts S-2B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot shut down the engine and force-landed the airplane in a field following a loss of oil pressure while performing an aerobatic maneuver. During the landing roll, the airplane nosed-over in muddy terrain. Post accident examination showed that a portion of the number 5 cylinder piston skirt had fractured and was located within the oil valve. The oil valve works through the means of gravity operated ball valves which includes two balls and a spring. During normal flight, the top ball valve is closed and the bottom ball valve is open. During inverted flight, the opposite is true. In this location, the fractured piece could prevent the ball assembly of the oil valve from seating.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of oil pressure due to metal pieces from the number 5 piston skirt in the oil system, which prevented the oil valve top ball valve from seating. The muddy terrain was a factor.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings

1. (C) FLUID,OIL - LOW PRESSURE
2. (C) ENGINE ASSEMBLY,PISTON - FRACTURED

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. PRECAUTIONARY LANDING - INITIATED - PILOT IN COMMAND

Occurrence #3: NOSE OVER
Phase of Operation: LANDING - ROLL

Findings
4. (F) TERRAIN CONDITION - MUDDY

Factual Information

On June 3, 2006, at 1435 Pacific daylight time, an Aviat Aircraft Incorporated Pitts S-2B, N117PS, lost oil pressure in flight and the pilot performed a precautionary landing to a hay field in Antioch, California. The airplane nosed over and sustained substantial damage. The commercial pilot, the sole occupant, was not injured. The airplane was registered to a private company and the pilot was operating it under the provisions of 14 CFR Part 91. Visual meteorological conditions prevailed and no flight plan had been filed for the local, personal aerobatic flight. The pilot departed from Livermore Municipal Airport, Livermore, California, at 1400.

The pilot reported that while performing an aerobatic sequence, the engine lost oil pressure and he elected to perform a precautionary landing in a field. The pilot shutdown the engine after 15 seconds when he had his landing spot secured. During the landing roll, the airplane nosed over in the muddy terrain.

The Federal Aviation Administration accident coordinator examined the engine following the accident. The engine oil sump contained approximately 9 quarts of oil. The oil pressure gauge was tested and no operational anomalies were noted. The engine was test-run; however, the oil pressure gauge did not indicate positive pressure. The oil pump was removed from the accessory case and was turned by hand. Oil was present within the oil pump and coated the gears and shaft. No heat signatures were evident.

The airplane was equipped with a Christen inverted oil system. The oil valve works through the means of gravity operated ball valves which includes two balls and a spring. During normal flight, the top ball valve is closed and the bottom ball valve is open. During inverted flight, the opposite is true. The oil valve was disassembled. Within the valve, a metal piece approximately 0.5-inch in length was identified between the two balls.

Later disassembly of the engine showed that portions of the number 5 piston skirt had fractured from the piston. Pieces of the fractured skirt were identified in the oil sump and filter.

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	34, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 1, 2005
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 1, 2005
Flight Time:	2285 hours (Total, all aircraft), 280 hours (Total, this make and model), 2095 hours (Pilot In Command, all aircraft), 139 hours (Last 90 days, all aircraft), 38 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aviat Aircraft Inc	Registration:	N117PS
Model/Series:	Pitts S-2B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Aerobatic; Normal	Serial Number:	5346
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	March 1, 2006 Annual	Certified Max Gross Wt.:	1625 lbs
Time Since Last Inspection:	49 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2256.3 Hrs at time of accident	Engine Manufacturer:	Textron Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	AEIO-540-D4A5
Registered Owner:	Team Fomori LLC	Rated Power:	260 Horsepower
Operator:	Yuichi Takagi	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	LVK,400 ft msl	Distance from Accident Site:	19 Nautical Miles
Observation Time:	14:53 Local	Direction from Accident Site:	340°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.96 inches Hg	Temperature/Dew Point:	32°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Livermore, CA (LVK)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	14:00 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	37.933334,-121.783332

Administrative Information

Investigator In Charge (IIC):	Dunks, Kristi
Additional Participating Persons:	Denny Pollard; Federal Aviation Administration; Oakland, CA
Original Publish Date:	June 27, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=63848

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).