Aviation Investigation Final Report

Location:	KATY, Texas	**Accident Number:**	FTW99LA228
Date & Time:	August 14, 1999, 18:30 Local	**Registration:**	N540DM
Aircraft:	Aviat S1-11B	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot was unable to maintain directional control of the aerobatic biplane during the landing roll due to failure of the brake master cylinder for the left brake. He reported that he had been operating in the designated aerobatic box above the airport for approximately 15 minutes, and while recovering from a hammer head stall, the propeller and engine oversped, and suspecting engine damage, he elected to execute a precautionary landing on runway 27. The airplane touched down about mid-field on the 4,300 foot grass/sod runway. The pilot applied brakes to exit the runway; however, the left brake failed, and the airplane 'made a violent turn to the right.' The tailwheel-equipped airplane nosed over and came to rest in the inverted position. The FAA inspector verified that the master cylinder for the left brake had failed, and braking was not possible. The 1998 model airplane had accumulated a total of 160 hours since new.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inability to maintain directional control of the tailwheel equipped biplane following the failure of the left brake master cylinder.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: LANDING - ROLL

Findings

1. (C) LANDING GEAR,NORMAL BRAKE SYSTEM - FAILURE
2. BRAKES(NORMAL) - NOT ATTAINED - PILOT IN COMMAND
3. (C) DIRECTIONAL CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: LANDING - ROLL

Factual Information

On August 14, 1999, at 1830 central daylight time, an Aviat-Pitts S1-11B biplane, N540DM, was substantially damaged following a loss of control during the landing roll at the Sack-O-Grande Airport near Katy, Texas. The instrument rated commercial pilot, sole occupant of the airplane, was not injured. The airplane was owned and operated by the pilot. Visual meteorological conditions prevailed for the Title 14 CFR Part 91 personal flight for which a flight plan was not filed. The local flight originated approximately 15 minutes prior to the accident.

The 1,400-hour pilot reported to the FAA inspector, who traveled to the accident site, that he had been operating in the designated aerobatic box above the airport for approximately 15 minutes. He added that "while recovering from a hammer head stall, the propeller and engine over sped," and suspecting engine damage, he elected to execute a precautionary landing on runway 27.

The pilot stated that the airplane touched down about mid-field on the 4,300 foot grass/sod runway. The airplane was decelerating through 40 knots when he applied brakes to exit the runway; however, the left brake failed, and the airplane "made a violent turn to the right." The left wing tip impacted the ground, and the tailwheel-equipped airplane nosed over and came to rest in the inverted position. The pilot was able to exit the biplane without assistance.

Examination of the wreckage by the FAA inspector revealed that the rudder and vertical stabilizer were crushed, the fuselage was wrinkled, and the left main landing gear was folded under the fuselage. The inspector verified that the master cylinder for the left brake had failed, and braking was not possible. He added that the 1998 airplane had accumulated a total of 160 hours since new.

The pilot reported that an examination of the engine revealed signs that an engine overspeed had occurred, necessitating the replacement of the engine.

Pilot Information

Certificate:	Commercial	**Age:**	36,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	March 25, 1999
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1400 hours (Total, all aircraft), 410 hours (Total, this make and model), 1200 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aviat	**Registration:**	N540DM
Model/Series:	S1-11B S1-11B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	4003
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	January 28, 1999 Annual	**Certified Max Gross Wt.:**	1600 lbs
Time Since Last Inspection:	35 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	160 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	AEIO-540
Registered Owner:	DAVID Z. MAFRIGE	**Rated Power:**	260 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	DAVID Z. MAFRIGE AIRSHOWS, INC	**Operator Designator Code:**	

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:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(9X59)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	18:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	SACK-O-GRANDE 9X59	**Runway Surface Type:**	Grass/turf
Airport Elevation:	175 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	
Runway Length/Width:	4300 ft / 80 ft	**VFR Approach/Landing:**	Full stop;Precautionary landing

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:**	29.75035,-95.740905(est)

Administrative Information

Investigator In Charge (IIC):	Casanova, Hector
Additional Participating Persons:	GALE R HUEY; HOUSTON , TX
Original Publish Date:	September 12, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47092