Aviation Investigation Final Report

Location:	Jackson, Michigan	**Accident Number:**	CHI05LA099
Date & Time:	April 18, 2005, 11:55 Local	**Registration:**	N1082D
Aircraft:	Cessna 195A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The tailwheel-equipped airplane ground-looped during the landing rollout. The pilot reported that a "normal approach and landing" was made and that "control was lost" at approximately 40 knots during the landing rollout. The pilot stated that the airplane "ground looped to the right." The pilot reported that, "Proper control inputs and operation were utilized until control surface [rudder authority] became ineffective." The pilot stated that the tailwheel steering "did not seem to work" and that use of asymmetric braking "had no effect." The pilot reported that "negligible wind conditions" prevailed. The runway contained a faint tire-track mark 336 feet in length curving toward the right, consistent with being left by the left main landing gear. The airplane traveled an additional 57 feet after the left main landing gear had separated from the fuselage. The left main landing gear spring fractured due to higher than normal side loads experienced during the ground-loop encounter. The tailwheel assembly was inspected after the accident and no anomalies were found with the strut, wheel, or steering linkages. The piston-rod for the left brake master cylinder was found fractured in two portions. The rod fractured at the mid-span snap ring grove. The master cylinder cover was deformed downward, adjacent to the center hole where the rod passed through the cover.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fracture of the left brake master cylinder piston rod, which resulted in the total failure of the left-side brake system and the subsequent loss of directional control during landing roll. An additional cause was the encountered ground-loop.

Findings

Occurrence #1: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: LANDING - ROLL

Findings
1. (C) LANDING GEAR,NORMAL BRAKE SYSTEM - FAILURE,TOTAL
2. (C) DIRECTIONAL CONTROL - NOT POSSIBLE
3. (C) GROUND LOOP/SWERVE - ENCOUNTERED - FLIGHTCREW

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING - ROLL

Findings
4. TERRAIN CONDITION - GROUND

Factual Information

On April 18, 2005, at 1155 eastern daylight time, a Cessna 195A, N1082D, piloted by an airline transport pilot, was substantially damaged when it ground-looped while landing on runway 14 (3,501 feet by 100 feet, asphalt) at the Jackson County Airport (JXN), Jackson, Michigan. Visual meteorological conditions prevailed at the time of the accident. The instructional flight was operating under the provisions of 14 Code of Federal Regulations (CFR) Part 91 without a flight plan. The pilot and his flight instructor were not injured. The local area flight departed JXN around 1045.

The pilot reported that the purpose of the flight was to obtain a flight review, as required by regulation 14 CFR Part 61.56. The pilot's previous flight review was completed on October 18, 2002.

The pilot stated that after completing some maneuvers in the practice area they returned to the airport to perform stop-and-go landings. The pilot reported that a "normal approach and landing" was made and that "control was lost" at approximately 40 knots during the landing rollout. The pilot stated that the airplane "ground looped to the right." The pilot reported that, "Proper control inputs and operation were utilized until control surface [rudder authority] became ineffective." The pilot stated that the tailwheel steering "did not seem to work" and that use of asymmetric braking "had no effect."

The flight instructor reported that the pilot "flew a stabilized approach" and the right main landing gear touched down first, followed by the left main landing gear and tailwheel. The flight instructor stated, "There was no aggressive forcing of the tailwheel onto the ground, and there was no bounce." The flight instructor reported that the airplane "swung violently" to the right after the tailwheel had made contact with the runway. The flight instructor stated, "Aggressive left rudder and even brake were applied by both pilots to no avail."

Wind information was collected from the weather observing station located at JXN. The wind data recorded at 1156 indicated the wind direction was variable at 3 knots with no gusts. The pilot reported that "negligible wind conditions" prevailed at the time of the accident.

The left main landing gear was found separated from the fuselage, resting on the runway. The runway contained a faint tire-track mark 336 feet in length curving toward the right, consistent with being left by the left main landing gear. The airplane traveled an additional 57 feet after the left main landing gear had separated from the fuselage.

The left main landing gear spring was sent to the National Transportation Safety Board (NTSB) Materials Laboratory for examination. The left spring fractured at the inboard end, approximately where the spring passed through the fillet plate and seal. The smooth

appearance, the presence of crack arrest marks, and the presence of a ratchet mark were consistent with the features of fatigue cracking from multiple origins. The remainder of the fracture face had a coarser, grainy appearance, clear chevron markings originating adjacent to the fatigue crack, and a shear lip - all features consistent with overstress fracture. The overstress fracture features initially propagated across the top of the spring (inboard), consistent with damage associated with a ground-loop event. Additional metallurgical information can be found in the NTSB Materials Laboratory Factual Report included in the docket information associated with this factual report.

The tailwheel assembly was inspected after the accident and no anomalies were found with the strut, wheel, or steering linkages. The piston-rod for the left brake master cylinder was found fractured in two portions. The rod fractured at the mid-span snap ring grove. The master cylinder cover was deformed downward, adjacent to the center hole where the rod passed through the cover.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	40,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Glider; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	December 1, 2004
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	November 1, 2004
Flight Time:	2392 hours (Total, all aircraft), 0 hours (Total, this make and model), 2280 hours (Pilot In Command, all aircraft), 79 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Multi-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 1 With waivers/limitations	**Last FAA Medical Exam:**	January 1, 2004
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	October 1, 2002
Flight Time:	12144 hours (Total, all aircraft), 9 hours (Total, this make and model), 8668 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N1082D
Model/Series:	195A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	7694
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	April 1, 2004 Annual	**Certified Max Gross Wt.:**	3350 lbs
Time Since Last Inspection:	6.4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5821 Hrs at time of accident	**Engine Manufacturer:**	Jacobs
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	R755B-2
Registered Owner:	On file	**Rated Power:**	275 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	JXN,1001 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	11:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.13 inches Hg	**Temperature/Dew Point:**	22°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Jackson, MI (JXN)	**Type of Flight Plan Filed:**	None
Destination:	Jackson, MI (JXN)	**Type of Clearance:**	VFR
Departure Time:	10:45 Local	**Type of Airspace:**	

Airport Information

Airport:	Jackson County Airport JXN	**Runway Surface Type:**	Asphalt
Airport Elevation:	1001 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	3501 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	42.259723,-84.459442

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Terry Blila; Federal Aviation Administration - Detroit FSDO; Belleville, MI
Original Publish Date:	May 30, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=61505