



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	PASCO, WA	<b>Accident Number:</b>	SEA96LA107
<b>Date &amp; Time:</b>	06/01/1996, 1230 PDT	<b>Registration:</b>	N1645A
<b>Aircraft:</b>	Piper PA-20	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 None

**Flight Conducted Under:** Part 91: General Aviation - Instructional

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## Analysis

The student pilot, who was flying solo at the time of the accident, reported that during the landing roll, the aircraft's left wing dropped and that he was unable to counter this wing drop with aileron. He stated that the tailwheel-equipped aircraft began a 'sweeping [right-hand] turn' at this point. He indicated on a sketch of the accident sequence that a 'L.H. tire skid mark' began at the point where the uncontrollable wing drop occurred, curving to the right until its termination point on the runway pavement, where he stated he believed the gear collapsed. The aircraft came to rest on the right shoulder of the runway. FAA Advisory Circular 61-21A, Flight Training Handbook, states that pilots of tailwheel aircraft must be especially vigilant for directional control problems during the after-landing roll since the aircraft's center of gravity is behind the main wheels, and notes that ailerons and rudder become less effective as the airplane slows during the landing roll. The pilot reported that he had 87.4 total pilot hours including 33.8 hours in type, 16.4 solo hours in type, and 45.8 hours of tailwheel aircraft time; and had received his solo and tailwheel endorsements within the previous 2 1/2 months.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to maintain directional control of the airplane during the landing roll, which resulted in an inadvertent ground swerve and collapse of the left main gear.

## Findings

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

### Findings

1. (C) DIRECTIONAL CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. (C) GROUND LOOP/SWERVE - INADVERTENT - PILOT IN COMMAND

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Occurrence #2: MAIN GEAR COLLAPSED  
Phase of Operation: LANDING - ROLL

### Findings

3. LANDING GEAR,MAIN GEAR STRUT - OVERLOAD

## Factual Information

On June 1, 1996, at approximately 1230 Pacific daylight time, a Piper PA-20, N1645A, being flown by a student pilot, sustained substantial damage in a loss of directional control and subsequent main landing gear collapse during landing rollout at Tri-Cities Airport in Pasco, Washington. The pilot of the tailwheel-equipped aircraft, who was its sole occupant, was not injured. Visual meteorological conditions prevailed and no flight plan had been filed for the local 14 CFR 91 solo instructional flight.

The pilot's landing attempt was on Pasco runway 21R (7,700 by 150 feet grooved asphalt.) The pilot reported:

Approach normal. Flared for 3-point. [Aircraft] ballooned slightly. Added slight power to arrest second descent to a 3-point touchdown. Right wing rose suddenly. Pilot corrected...(windsock had just been observed with slight breeze from South). Aircraft leveled momentarily; as ailerons lost effectiveness [aircraft] began sweeping [right hand] turn. Pilot added takeoff power to realign [aircraft with centerline; power aggravated situation. Pilot pulled power as aircraft passed through approximately 30 [degrees] from centerline. [Aircraft] was settling on right hand side....Aircraft came to rest on shoulder of runway.

On a hand-sketched diagram of the accident sequence, the pilot indicated that a "L.H. tire skid mark" began at approximately the point where a "2nd wing drop" occurred which he "could not bring up [with] ailerons", and that the aircraft began a right turn at this point. The pilot depicted the skid mark as curving to the right, and indicated at the skid mark's termination point on the diagram: "gear folds under (I guess)". The indicated termination point of the skid mark was on the pavement in the right half of the runway. The pilot described the weather at the time of the accident as fair, temperature 70 degrees, and winds less than 5 knots.

FAA Advisory Circular (AC) 61-21A, Flight Training Handbook (1980), states the following regarding the after-landing roll:

The pilot must be alert for directional control difficulties immediately upon and after touchdown due to the ground friction on the wheels. This is especially true in tailwheel-type airplanes because...the center of gravity [CG] is behind the main wheels....Any difference between the direction the...airplane is traveling and the direction it is headed will produce a moment about the pivot point of the wheels and the airplane will tend to swerve....The combination of centrifugal force acting on the CG and ground friction of the main wheels resisting it...may... impose a sideward force which could collapse the landing gear. Tailwheel-type airplanes are most susceptible to ground loops late in the after-landing roll because rudder effectiveness decreases with the decreasing flow of air along the rudder surface as the airplane slows.

AC 61-21A also notes in the same section that "as the forward speed of the airplane decreases, the ailerons will become less effective."

The pilot reported that at the time of the accident, he had 87.4 hours of total pilot time including 33.8 hours in the accident aircraft type, 16.4 hours solo in type, and 45.8 hours of tailwheel aircraft time. The pilot's instructor authorization to solo the PA-20 on his student pilot certificate (per 14 CFR 61.87c), and his instructor tailwheel aircraft endorsement in his pilot logbook (per 14 CFR 61.31g), were both dated March 18, 1996, about 2 1/2 months before

the accident.

## Pilot Information

<b>Certificate:</b>	Student	<b>Age:</b>	51, Male
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	03/05/1996
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	88 hours (Total, all aircraft), 34 hours (Total, this make and model), 28 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N1645A
<b>Model/Series:</b>	PA-20 PA-20	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	20-843
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	10/20/1995, Annual	<b>Certified Max Gross Wt.:</b>	1950 lbs
<b>Time Since Last Inspection:</b>	31 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2300 Hours	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-320
<b>Registered Owner:</b>	DENNIS E. KELSEY	<b>Rated Power:</b>	150 hp
<b>Operator:</b>	DENNIS E. KELSEY	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>	KELSEY FIVE, INC.	<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0000	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Light and Variable /	Turbulence Type Forecast/Actual:	/
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	21 °C
Precipitation and Obscuration:			
Departure Point:	(PSC)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	VFR
Departure Time:	1030 PDT	Type of Airspace:	Class D

## Airport Information

Airport:	TRI-CITIES (PSC)	Runway Surface Type:	Asphalt
Airport Elevation:	407 ft	Runway Surface Condition:	Dry
Runway Used:	21R	IFR Approach:	None
Runway Length/Width:	7700 ft / 150 ft	VFR Approach/Landing:	Full Stop

## Wreckage and Impact Information

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

## Administrative Information

Investigator In Charge (IIC):	GREGG	NESEMEIER	Report Date:	04/03/1997
Additional Participating Persons:				
Publish Date:				
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .			

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).