National Transportation Safety Board
Aviation Accident Final Report

Location:	Talkeetna, AK	**Accident Number:**	ANC07LA060
Date & Time:	07/01/2007, 1745 AKD	**Registration:**	N3195Z
Aircraft:	Piper PA-18	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The private pilot was landing a tundra tire-equipped airplane on an off-airport grass surface area. As he applied the brakes during the landing roll, the left main landing gear collapsed. The airplane pivoted to the left, and the left wing struck the ground. His inspection of the landing gear revealed that the outboard end of the left main landing gear strut extension was broken through the outer radius of the attaching lug, where it normally would bolt to the axle. In addition, the landing gear safety cable was broken. The airplane was equipped with hydrasorb landing gear shock units, which consist of automotive type oleo struts, combined with light shock cords. Examination of the outboard end of the hydrasorb extension tube revealed a flat fracture surface that was perpendicular to the long axis of the tube. It had extensive evidence of corrosion. The landing gear had been installed since 1977, and the most recent annual inspection of the airplane was about 1 year before the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A fracture and collapse of the main landing gear. Contributing to the accident was an inadequate annual inspection by other maintenance personnel, and corrosion.

Findings

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

Findings
1. (C) LANDING GEAR,MAIN GEAR SHOCK ABSORBING STRUT - FRACTURED
2. (F) MAINTENANCE,ANNUAL INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
3. (F) LANDING GEAR,MAIN GEAR SHOCK ABSORBING STRUT - CORRODED

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

Findings
4. LANDING GEAR,MAIN GEAR ATTACHMENT - COLLAPSED

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING - ROLL

Findings
5. TERRAIN CONDITION - GRASS

Factual Information

On July 1, 2007, about 1745 Alaska daylight time, a tundra tire-equipped Piper PA-18 airplane, N3195Z, sustained substantial damage during the landing roll at a remote airstrip along the Kahiltna River, about 25 miles west-southwest of Talkeetna, Alaska. The airplane was being operated as a visual flight rules (VFR) cross-country personal flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by the pilot. The private certificated pilot, the sole occupant, was not injured. Visual meteorological conditions prevailed. The flight originated at the Wolf Lake Airport, Wasilla, Alaska, about 1600, and no flight plan was filed.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on July 2, the pilot reported that he was landing on a grass surface area that was oriented north/south. The area was about 800 feet long, and about 50 feet wide, and he was landing toward the south. He said that during the landing roll, as he applied the brakes, the left main landing gear collapsed. The airplane pivoted to the left, and the left wing struck the ground. His inspection of the landing gear revealed the shock strut and the safety cable were broken. The pilot said he did not think the landing was in anyway hard, and the wind conditions were about 180 degrees at 8 knots.

On July 6, the owner of a maintenance facility reported that the airplane received structural damage to the left wing and both wing spars.

The airplane was equipped with hydrasorb landing gear shock units, which consist of automotive type oleo struts, combined with light shock cords. The outboard end of the hydrasorb has an extension tube that is normally installed between the wheel axle and the hydrasorb unit. In addition, the landing gear had upper and lower safety cables. The safety cables limit the upward travel of the wheel if a strut unit should fail. The upper safety cable is attached between the fuselage tubing and the center cabane. The lower safety cable is attached between the main wheel axle and the center cabane.

On July 10, the pilot brought the broken left hydrasorb strut extension tube to the NTSB Alaska Regional Office. The outboard end of the tube was fractured through the outer radius of the attaching lug, where it normally would bolt to the axle. Visual examination of the broken tube revealed a flat fracture surface that was perpendicular to the long axis of the tube. It had extensive evidence of rust and pitting.

In the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by the pilot, the pilot indicated that the most recent annual inspection was July, 2006, but he did not indicate any airframe total time, or time accrued since the inspection. He did indicate that the main landing gear struts had been installed since 1977.

According to FAA aircraft certification staff, the accident airplane does not have a manufacturer's maintenance manual. The military version of the accident airplane, the L-21, did have a maintenance manual. Paragraph 2-85, Inspection of Main Landing Gear, of the L-21 manual states, in part: "a. Examine all attaching nuts and bolts for wear, distortion, and damaged threads. Replace damaged part. b. Inspect all metal parts for cracks, distortion, corrosion, and other damage. Replace parts that are damaged beyond repair. Corroded spots must be sanded down to good metal and coated with primer..."

Information about aviation maintenance standards are contained in the FAA's advisory circular, AC 43.13-1B, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and

Repair. Chapter 9 of the AC, Aircraft Systems and Components, Section 1, Inspection and Maintenance of Landing Gear, states, in part: "9-2. General Inspection; A thorough inspection of the landing gear involves the entire structure of the gear, including attachment, struts, wheels, brakes... . The manufacturer's inspection procedures should be followed where applicable. 9-4. Fixed gear inspection. Fixed landing gear should be examined regularly for wear, deterioration, corrosion, alignment, and other factors that may cause failure or unsatisfactory operation. During a 100-hour or annual inspection of the fixed gear, the aircraft should be jacked up to relieve the aircraft weight. The gear struts and wheels should be checked for play and corrected... (g) The entire structure of the landing gear should be closely examined for cracks, nicks, cuts, corrosion damage, or any other condition that can cause stress concentrations and eventual failure."

Chapter 6, Section 5, Visual Corrosion Inspection Guide for Aircraft, of AC 43.13-1B, states, in part: "6-63. General; This guide provides a general inspection checklist for those parts or surfaces that can be visually inspected without disassembly of the aircraft. 6-68. Wheel wells and landing gear; Inspect wheel well area and landing gear components for damage to exterior finish coating and corrosion. Particular attention should be given to exposed surfaces of struts, oleos, arms, links, and attaching hardware; axle interiors, exposed position indicator switches and other electrical equipment; crevices between stiffeners, ribs, and lower skin surfaces; magnesium wheels, particularly around bolt heads, lugs, and wheel web areas; and exposed rigid tubing at "B" nuts and ferrules under clamps, and tubing identification tapes."

Pilot Information

Certificate:	Private	**Age:**	31, Male
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	01/01/2006
Occupational Pilot:		**Last Flight Review or Equivalent:**	11/01/2006
Flight Time:	500 hours (Total, all aircraft), 400 hours (Total, this make and model), 400 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Piper	**Registration:**	N3195Z
Model/Series:	PA-18	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	18-7191
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	07/01/2006, Annual	**Certified Max Gross Wt.:**	1750 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-B2B
Registered Owner:	Chadwick P. McGrady	**Rated Power:**	150 hp
Operator:	Chadwick P. McGrady	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:		**Observation Time:**	
Distance from Accident Site:		**Condition of Light:**	Day
Direction from Accident Site:		**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Scattered / 1500 ft agl	**Temperature/Dew Point:**	16°C
Lowest Ceiling:	Broken / 2000 ft agl	**Visibility**	20 Miles
Wind Speed/Gusts, Direction:	8 knots, 180°	**Visibility (RVR):**	
Altimeter Setting:		**Visibility (RVV):**	
Precipitation and Obscuration:	Light - N/A		
Departure Point:	Wasilla, AK (4AK6)	**Type of Flight Plan Filed:**	None
Destination:	Talkeetna, AK	**Type of Clearance:**	None
Departure Time:	1600 ADT	**Type of Airspace:**	

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		

Administrative Information

Investigator In Charge (IIC):	Scott Erickson	**Adopted Date:**	03/31/2008
Additional Participating Persons:	Terry Musick; FAA-AL-ANC FDSO 03; Anchorage, AK		
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 pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		