Aviation Investigation Final Report

Location:	Kent, Washington	**Accident Number:**	SEA03LA098
Date & Time:	June 11, 2003, 21:00 Local	**Registration:**	N7568T
Aircraft:	Cessna R182	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The CFI and private pilot reported that prior to practicing landings air work was accomplished which included numerous flap transitions from 40 degrees to 20 degrees. On short final for a touch-and-go landing the flaps were selected to 40 degrees, the full down position. Touchdown was within 300 feet of the runway threshold. During the landing rollout the instructor directed the student to set the flaps to 20 degrees, which the instructor double checked by looking at the flap selector lever. Power was added and the airplane rotated about 600 to 700 feet down the runway. After 5 seconds in the air the rear-seated passenger announced that the flaps were still full down. The instructor looked at the flap handle, which was at the 20-degree position, then moved it several times between the 20-degree and 0-degree position. The rear-seated passenger again announced that the flaps were not moving. As the instructor noticed the rate of climb was poor, he retracted the gear to reduce drag. Due to the poor performance and concern about clearing the obstacles ahead, he elected to land straight ahead on the 2,200 feet of runway remaining. Taking control of the airplane, the instructor reduced power and selected the landing gear to extend. When the aircraft touched down the nose gear was fully locked down, while both main landing gear were not in the down and locked position as a result of not having adequate time to extend; they were partially collapsed. Examination by an FAA inspector, who arrived about one hour after the accident, revealed the flaps were in the 40-degree position. All attempts by the inspector to move the flaps out of the 40-degree position with the flap selector lever were unsuccessful. However, after the aircraft was moved and the main landing gear extended to its down and locked position, FAA inspectors observed the flaps operate normally through their full range. An airframe and power plant mechanic found no anomalies which would have prevented normal operation. On the preceding flight the flaps had been written up as sticking full down twice.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the flaps to operate properly for undetermined reasons during the initial climb and subsequent aborted takeoff. A factor was the collapse of the main landing gear due to an inadequate amount of time for the gear extension process to be completed.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) FLT CONTROL SYST,WING FLAP CONTROL - FAILURE
2. (C) REASON FOR OCCURRENCE UNDETERMINED
3. AIRCRAFT PERFORMANCE,CLIMB CAPABILITY - DETERIORATED
4. RAISING OF FLAPS - NOT POSSIBLE

Occurrence #2: FORCED LANDING
Phase of Operation: TAKEOFF - ABORTED

Occurrence #3: GEAR COLLAPSED
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
5. (F) LANDING GEAR,MAIN GEAR - COLLAPSED

Factual Information

On June 11, 2003, approximately 2100 Pacific daylight time, a Cessna R182, N7568T, was substantially damaged when it impacted terrain following an aborted takeoff at the Crest Airpark (S36), Kent, Washington. The airplane was registered to the Boeing Employees Flying Association of Renton, Washington. The certified instructor pilot, his student and one passenger were not injured. Visual meteorological conditions prevailed for the instructional flight which was conducted under 14 CFR Part 91, and no flight plan was filed. The flight departed the Renton Municipal Airport, Renton, Washington, at 2010.

According to the flight instructor and the pilot receiving instruction, the purpose of the flight was to conduct a high performance and complex airplane flight for the student, a private pilot, as well as an opportunity for the right rear-seated passenger, a commercial pilot and flight instructor student, to observe. The instructor pilot stated that after an hour long briefing the flight departed and a half hour of air work was conducted, which included numerous flap transitions from 40 degrees to 20 degrees during stall recoveries. The flight then proceeded to S36. En route the student was briefed about the configuration procedure for the planned short field takeoff (55 knots at flaps 20 degrees) which would follow the touch-and-go landing. On short final to runway 33 (3,285 feet X 40 feet) the flaps were selected to 40 degrees, the full down position, and touchdown was within 300 feet of the runway threshold. During the landing rollout the instructor directed the student to set the flaps to 20 degrees. The instructor stated, "I double checked it, and at our urging, got going on the takeoff right away. The airplane probably rotated about 600 to 700 feet down the runway." The takeoff was uneventful until about 5 seconds after being in the air, when the rear-seated passenger announced that the flaps were still full down. The instructor reported, "I looked at the flap handle and it was at 20. I looked at the detent, and in the process moved it [flap handle] around between 20 and 0 several times and briefly glanced at the flaps as well." The rear-seated passenger again announced that the flaps were not moving. The pilot said they were now flying at about 55 to 60 knots and were less than halfway up the treetops lining the runway and their rate of climb was very poor. The pilot said he raised the gear in order to reduce drag, but based on his position down the runway and altitude and angle of climb, he stated he had serious concerns about clearing the obstacles ahead. With approximately 2,200 feet of runway remaining the pilot believed that a straight-ahead landing was possible and that it was the only safe course of action to take, based on their current and projected performance at the time. The instructor then took over control of the aircraft, reduced power, and lowered the gear. A significant nose down pitch was necessary to make the power off landing and the instructor was concerned about the possibility of not having a full gear extension prior to touchdown. He considered adding power just above the runway to get the gear locked down, but felt he would run off the end of the runway if he did. The pilot reported the touchdown was "light" and that he opened his door just before the airplane came to a stop on its right wingtip. The nose gear was fully locked down, while both main landing gear were partially collapsed. The student shut off the

electrical equipment and all three occupants evacuated the airplane. The aircraft came to rest in an upright position approximately 525 feet off the departure end of the runway, slightly right of centerline.

An FAA inspector, who traveled to the accident site, reported that upon arrival he noted the flaps were in the FULL DOWN, 40-degree position, while the flap selector lever was in the FULL UP, or 0-degree position. After power was applied to the aircraft and the flap selector lever moved to different positions through its range, the flaps would not move and remained at the 40-degree, FULL DOWN position.

Subsequently, two additional FAA inspectors, who also traveled to the accident site, reported that after hoisting the aircraft and applying electrical power to the landing gear system, the left and right main landing gear extended and locked in the down position normally. The inspectors also operated the flaps through their full range and reported the operation of the flaps as normal. The inspectors reported substantial damage to the right horizontal stabilizer, a crack in the tail cone, and damage to the right wing tip and right elevator counterbalance.

In a telephone interview with the flight instructor and his student, the NTSB investigator-in-charge (IIC) was informed that the flaps had been "written up" on two previous occasions over the past two or three months. The instructor also informed the IIC that the airplane's Aircraft Discrepancy Log indicated the flaps had been written up on the flight prior to the accident flight; "...flaps stuck full down twice. Recycling switch fixed problem each time." The flight instructor said he wasn't aware of the open write-up, as he delegated his student to check the Aircraft Discrepancy Log prior to departure. The student informed the IIC that he didn't notice the write-up, as the discrepancy sheet was out of order.

Post-accident examination of the flap control system by a licensed airframe and powerplant mechanic revealed no anomalies which would prevent normal operation, and a flap malfunction condition could not be duplicated.

In the Recommendation section of the NTSB Form 6120.1/2, the instructor commented that he should have reviewed the maintenance log with the student prior to the flight, rather than rely on the student reviewing it alone. The instructor also recommended that flaps should be visually checked by looking at the actual flap position instead of relying on the flap handle position prior to takeoff.

Pilot Information

Certificate:	Commercial	**Age:**	43,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	August 7, 2002
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 1, 2002
Flight Time:	2254 hours (Total, all aircraft), 58 hours (Total, this make and model), 2158 hours (Pilot In Command, all aircraft), 46 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Private	**Age:**	25,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	March 6, 2002
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 28, 2002
Flight Time:	78 hours (Total, all aircraft), 1 hours (Total, this make and model), 36 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7568T
Model/Series:	R182	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	R18200039
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 24, 2002 Annual	**Certified Max Gross Wt.:**	3100 lbs
Time Since Last Inspection:	294.4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	6839.4 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-540
Registered Owner:	Boeing Employees Flying Association	**Rated Power:**	235 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RNT,32 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	20:53 Local	**Direction from Accident Site:**	335°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.89 inches Hg	**Temperature/Dew Point:**	18°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Renton, WA (RNT)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	20:10 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Crest Airpark S36	**Runway Surface Type:**	Asphalt
Airport Elevation:	466 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	33	**IFR Approach:**	None
Runway Length/Width:	3285 ft / 40 ft	**VFR Approach/Landing:**	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	47.342498,-122.104446

Administrative Information

Investigator In Charge (IIC):	Little, Thomas
Additional Participating Persons:	David G Lehman; Federal Aviation Administration; Seattle, WA
Original Publish Date:	November 25, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57202