# Aviation Investigation Final Report

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| **Location:** | BREMERTON, Washington | **Accident Number:** | SEA99LA073 |
| **Date & Time:** | May 23, 1999, 15:35 Local | **Registration:** | N2567K |
| **Aircraft:** | Cessna 180K | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 1 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot reported that he performed a normal wheel landing. During the landing roll, the left main gear leg failed. Post-accident inspection revealed that the attachment bolt from the gear leg broke in two pieces. During the metallurgical examination, the specialist found that three major fracture zones were present. Two of the zones were fairly flat and propagated on a plane that was perpendicular to the bolt axis, typical of fatigue progression. One of the zones was covered with heavy accumulation of oxides and corrosion deposits. The other zone was free of oxidation and deposits. The third zone displayed a fracture propagation on a 45 degree slant. This zone was typical of a final overstress separation. The fatigue zones occupied about 75 percent of the bolt cross section at the fracture location. The specialist reported that the presence of oxide and corrosion deposits suggested an 'old crack.' There was no evidence found of thread stripping. Maintenance records indicate that since the time of manufacture in 1978, the aircraft had accumulated a total time of 77 hours. During this time, there were several years in which the aircraft had not been operated.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure of the landing gear attach bolt due to fatigue failure resulting in the left main landing gear collapsing.

## Findings

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

Findings
1. (C) LANDING GEAR,MAIN GEAR ATTACHMENT - FATIGUE

## Factual Information

On May 23, 1999, approximately 1535 Pacific daylight time, a Cessna 180K, N2567K, impacted the runway at Bremerton National Airport, Bremerton, Washington, after the failure of a main gear leg during the landing roll. The private pilot, who was the operator of the aircraft, was not injured, but the aircraft sustained substantial damage. The 14 CFR Part 91 flight, which departed Crest Airpark, Covington, Washington, about 30 minutes earlier, was being operated in visual meteorological conditions. No flight plan had been filed, and there was no report of an ELT activation.

According to the pilot, who was performing a wheel landing, the touchdown was normal. But as the landing roll continued, he lost control of the aircraft when the left main gear leg failed. Immediately after the gear failed, the aircraft settled onto the runway and slid to a stop.

Post-accident inspection revealed that the attachment bolt from the gear leg broke in two pieces. The bolt was sent to the National Transportation Safety Board Materials Laboratory, Washington D.C. for examination. The specialist reported that "the bolt separated at the edge of the self-locking nut, through the first thread on the shank." Further examination with the aid of a low-power binocular microscope revealed three major fracture zones. The specialist reported that two of the zones were "fairly flat and propagated on a plane that was roughly perpendicular to the bolt axis, typical of fatigue progression." One of the zones was covered with heavy accumulation of oxides and corrosion deposits. The other zone was free of oxidation and deposits. The third zone displayed a fracture propagation on a slant (45 degree) plane. The specialist reported this zone as "typical of a final overstress separation." The specialist reported that "the fatigue occupied approximately 75 percent of the bolt cross section at the fracture location." The specialist also reported that the presence of oxide and corrosion deposits suggest an "old crack." There was no evidence found of thread stripping.

The aircraft was purchased new in 1978. The aircraft maintenance logbooks indicate that that the aircraft had accumulated about 38 hours of total time at the annual inspection performed in March of 1981. The next annual inspection was signed off in June 1995, with a total time still indicating 38 hours. In February 1999, the logbook indicated an annual inspection with a total time of 69.5 hours accumulated. The pilot reported a total aircraft time of 77 hours at the time of the accident.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 42,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 3 Valid Medical--w/ waivers/lim | **Last FAA Medical Exam:** | March 10, 1998 |
| **Occupational Pilot:** | UNK | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 345 hours (Total, all aircraft), 40 hours (Total, this make and model), 11 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Cessna | **Registration:** | N2567K |
| **Model/Series:** | 180K 180K | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 18052990 |
| **Landing Gear Type:** | Tailwheel | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | February 2, 1999 Annual | **Certified Max Gross Wt.:** | 2650 lbs |
| **Time Since Last Inspection:** | 8 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 77 Hrs | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | O-470-U |
| **Registered Owner:** | CESSNA AIRCRAFT FACTORY | **Rated Power:** | 230 Horsepower |
| **Operator:** | KENNETH D. BRYANT | **Operating Certificate(s) Held:** | None |
| **Operator Does Business As:** | | **Operator Designator Code:** | |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | PWT ,439 ft msl | **Distance from Accident Site:** | |
| **Observation Time:** | 15:55 Local | **Direction from Accident Site:** | |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 9 knots / None | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 50° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30 inches Hg | **Temperature/Dew Point:** | 27°C / 9°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | CREST AIRPARK (S36 ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | (PWT ) | **Type of Clearance:** | None |
| **Departure Time:** | 15:00 Local | **Type of Airspace:** | Class E |

## Airport Information

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| **Airport:** | BREMERTON NATIONAL PWT | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 439 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 1 | **IFR Approach:** | None |
| **Runway Length/Width:** | 6200 ft / 150 ft | **VFR Approach/Landing:** | Traffic pattern |

## Wreckage and Impact Information

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| **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:** | 47.570384,-122.630149(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Anderson, Orrin |
| **Additional Participating Persons:** | CHUCK REYNOLDS; RENTON , WA |
| **Original Publish Date:** | January 18, 2001 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=46604 |