

No. 13

Norseman V, CF-BHW (Skiplane), accident 73 miles northwest of Pickle Lake, Ontario, Canada, on 22 January 1963. Accident Report No. 1902, released by the Department of Transport, Canada.

1. Investigation1.1 History of the flight

The aircraft took off from Pickle Lake, Ontario on a flight to Round Lake, Bear Skin Lake, Trout Lake and Big Beaver House. The type of flight and time of departure were not stated in the report. The aircraft did not arrive at any of the intermediate points nor at its destination. Nothing further was heard or seen of it until it was found on 30 May 1963 approximately 73 miles northwest of Pickle Lake (52°24'N - 90°54'W).

The investigation showed that break up of the left wing had occurred in flight prior to impact. The time of the accident was calculated to be 1215 hours central standard time.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	1		
Non fatal			
None			

The pilot, the sole occupant of the aircraft, was killed on impact.

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

No damage was sustained by objects other than the aircraft.

1.5 Crew information

The pilot held a Senior Commercial Pilot's Licence and had flown a total of 2 886 hours, including 1 277 hours on the subject aircraft type, of which 130 hours were flown during the 90 days before the accident.

1.6 Aircraft information

A Certificate of Airworthiness had been issued for the aircraft.

1.7 Meteorological information

The weather conditions existing at the time of the accident were:

ceiling: unlimited, visibility: 1 to 6 miles in ice crystals,
temperature: colder than -25°F , dew point: lower than -30°F ,
wind: from the northwest at 22 mph.

1.8 Aids to navigation

No information in this regard was contained in the report.

1.9 Communications

Not mentioned in the report.

1.10 Aerodrome and ground facilities

Not relevant to the accident.

1.11 Flight recorders

Not mentioned in the report.

1.12 Wreckage

Pieces of the left wing were found along the wreckage trail, which extended for about $3/8$ of a mile on a track of 150°M .

The aircraft was inverted and buried deeply in muskeg at the main point of impact. The engine and propeller were buried deeply in the muskeg and were not recovered.

1.13 Fire

Fire burned the aft portion of the cabin, fuselage and part of the tail section. It had destroyed the right wing except for metal parts and heavy spar timber.

1.14 Survival aspects

In spite of an extensive search, the aircraft was not located until 30 May 1963 (i. e. approximately 4 months after the accident occurred).

1.15 Tests and research

The top portions of the lift struts and the associated wing fittings and the inboard wing fittings were removed from the aircraft for laboratory examination. A Department of Mines and Technical Surveys Report (IR63-71) indicated that the failure of the upper forward eyebolt of the left wing strut was primarily due to fatigue and that the crack

initiated in a thread root. It then propagated through about one-third of the cross section, at which stage a brittle fracture of the remaining cross section occurred. A significant feature of the fracture was that initiation and propagation were parallel to the axis of the cross head bolt along the longitudinal axis of the aircraft. (A similar failure occurred in 1958, and the cracks in both cases had initiated in a thread root and extended through the same area of cross section.)

Further tests and examination of a number of sample eyebolts were carried out and revealed substantial dimensional and material differences in the part. However, it was considered unlikely that the fatigue properties of any eyebolt in service would be significantly lower because of these factors. It was suggested by the laboratory that some additional loading in excess of normal flight loads must have been superimposed. The appearance of the fractures was consistent with the imposition of cyclic plane bending loads, which could have been caused by an unobserved structural defect, excessive clearance in the main root fixtures or by transverse flexure of the wing. It was not possible to establish that any of these factors prevailed during the operation of this aircraft.

2. Analysis and conclusions

2.1 Analysis

Examination of the left wing wreckage eliminated the possibility that the aircraft may have been struck by a foreign object. Both left and right flap operating jacks were in the fully retracted position. All aileron hinges and control cables appeared to be airworthy prior to separation of the left wing. Examination of the left wing strut revealed that the upper forward eyebolt had failed from fatigue, and the fatigue failure area had extended about 30% across the break prior to failure. Failure of this eyebolt was followed by separation of the wing in an upward motion towards the rear of the aircraft.

2.2 Conclusions

Findings

The pilot's licence was valid at the time of the accident, and he had flown approximately 1 277 hours on this type of aircraft.

A Certificate of Airworthiness had been issued for the aircraft, and there was no evidence of any fault in the engine or controls prior to the accident. While en route a fatigue failure of the upper forward eyebolt of the left wing resulted in break up of the left wing while in flight, and the aircraft crashed.

Cause or Probable cause(s)

The accident was attributed to fatigue failure of the front eyebolt on the left wing strut.

3. Recommendations

It was not possible at the time this report was released to determine conclusively the primary cause of this failure. However, further laboratory work was being carried out and in the event of any significant findings, this report was to be revised.

Pending the receipt of any additional information relating to this failure, compliance with Airworthiness Directive 63-66, dated July 1963, should serve as an adequate safeguard against repetition of this type of failure.
