

**Aviation Safety Investigation Report  
199301050**

**Piper Aircraft Corp  
Chieftain**

**05 February 1993**

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**Occurrence Number:** 199301050                      **Occurrence Type:** Accident  
**Location:** Moorabbin  
**State:** VIC    **Inv Category:** 4  
**Date:** Friday 05 February 1993  
**Time:** 1014 hours                                      **Time Zone**                      ESuT  
**Highest Injury Level:** None

**Aircraft Manufacturer:** Piper Aircraft Corp  
**Aircraft Model:** PA-31-350  
**Aircraft Registration:** VH-PWA                      **Serial Number:** 31-7652072  
**Type of Operation:** Charter                      Cargo  
**Damage to Aircraft:** Substantial  
**Departure Point:** King Island  
**Departure Time:**  
**Destination:** Moorabbin

**Approved for Release:** Tuesday, April 16, 1996

When the gear was selected down only the left main gear gave a down indication. The pilot carried out emergency extension procedures which resulted in a down indication for the right main gear. During the subsequent landing with the nose landing gear trailing, the lower fuselage and propellers were abraded.

Investigation disclosed that the hydraulic system had lost its oil overboard through the right engine hydraulic pump case drain. This occurred because the left engine driven hydraulic pump main shaft seals had been incorrectly assembled. The two seals are required to be placed back to back on the shaft, with one cup facing into the pump body and one facing away from the body. The seals had been placed with both cups facing away from the pump body.

This allowed the pump to force oil past the inner seal instead of the pressure acting to positively seat the seal onto the shaft. The pump was newly overhauled having been fitted to the engine on the day prior to the accident. It had completed one flight of 1.7 hours duration. Although the hydraulic reservoir contains an emergency oil supply, it is suspected that foaming of the contents due to pump cavitation precluded successful extension of all landing gears.

Significant factors.

1. The seals on the main shaft of the right engine driven hydraulic pump were incorrectly installed.
  2. The hydraulic oil was pumped overboard past the incorrectly installed seals.
  3. The emergency oil supply was not able to successfully extend all three landing gears.
  4. During the landing roll the nose landing gear collapsed.
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