

**Aviation Safety Investigation Report  
199403630**

**Piper Aircraft Corp  
Navajo**

**03 December 1994**

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**NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at [www.atsb.gov.au](http://www.atsb.gov.au).**

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

**Occurrence Number:** 199403630                      **Occurrence Type:** Accident  
**Location:** 155km N Adelaide  
**State:** SA                                              **Inv Category:** 4  
**Date:** Saturday 03 December 1994  
**Time:** 1033 hours                      **Time Zone** CSuT  
**Highest Injury Level:** None

**Aircraft Manufacturer:** Piper Aircraft Corp  
**Aircraft Model:** PA-31  
**Aircraft Registration:** VH-MNT                      **Serial Number:** 31-7812104  
**Type of Operation:** Non-commercial Business  
**Damage to Aircraft:** Substantial  
**Departure Point:** Parafield SA  
**Departure Time:** 0956 CSuT  
**Destination:** Alice Springs NT

**Crew Details:**

<b>Role</b>	<b>Class of Licence</b>	<b>Hours on Type</b>	<b>Hours Total</b>
Pilot-In-Command	Commercial	130.0	1500

**Approved for Release:** Monday, August 26, 1996

In cruise at 10,000 ft the pilot noticed the left alternator light had illuminated, and that the right alternator was now taking all electrical loads. The left engine power then reduced from 31hg to 23hg, suggesting to the pilot that the turbo-charger was malfunctioning. As the aircraft was now unable to maintain its cruise altitude the pilot requested a descent to 7,000 ft. He also requested an airways clearance to return to Parafield.

He changed the left fuel tank selection from the main to auxiliary, and turned the left fuel boost pump on. This restored engine power for a short period of time before it suffered a complete failure, followed by a complete loss of electrical power and smoke entering the cabin.

The pilot feathered the left propeller, and turned the fuel selector and all electrical switches off. He maintained communications with Adelaide FIS using a mobile telephone. A successful single engine landing was made after the pilot manually extended the landing gear.

An investigation indicated that the alternator field wire had chaffed on the engine fuel supply line, wearing through its insulation which allowed the bared wire to then arc on the line, eventually burning a hole through it. The ensuing loss of fuel supply through the hole, with associated loss in fuel pressure, contributed to the reduction of engine power. Activation of the fuel boost pump assisted in restoring some pressure, and power.

Fuel spraying from the holed line was ignited by the arcing alternator field wire, causing fire damage to the wing leading edge skin, wing structure rear of the firewall, oil pressure, hydraulic and fuel supply lines, and the nacelle fuel tank and vent lines. The electric loom between the engine and cabin had the insulation burnt off, allowing it to short circuit and cause the electrical failure. The magneto earth wires, being part of this loom, and also bared of insulation, grounded both magnetos, shutting down the engine.

The engine failing due to the grounded magnetos, and the pilots action of turning the fuel off, probably deprived the fire of fuel before it became established, and self extinguished.

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