

**Aviation Safety Investigation Report  
199300423**

**Aero Commander Div  
Shrike Commander**

**09 March 1993**

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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).**

199300423

<b>Occurrence Number:</b> 199300423	<b>Occurrence Type:</b> Incident
<b>Location:</b> Tennyson Beach - 12km north of Adelaide Airport	
<b>State:</b> SA	<b>Inv Category:</b> 4
<b>Date:</b> Tuesday 09 March 1993	
<b>Time:</b> 1706 hours	<b>Time Zone:</b> CST
<b>Highest Injury Level:</b> None	

<b>Aircraft Manufacturer:</b> Aero Commander Div	
<b>Aircraft Model:</b> 500-S	
<b>Aircraft Registration:</b> VH-ACZ	<b>Serial Number:</b> 3176
<b>Type of Operation:</b> Air Transport Domestic Low Capacity Passenger Scheduled	
<b>Damage to Aircraft:</b> Minor	
<b>Departure Point:</b> Adelaide SA	
<b>Departure Time:</b> 1653 CST	
<b>Destination:</b> Port Augusta SA	

**Crew Details:**

Role	Class of Licence	Hours on	
		Type	Hours Total
Pilot-In-Command	ATPL 1st Class	333.0	2690

**Approved for Release:** Friday, January 13, 1995

The aircraft had operated a normal scheduled service, arriving in Adelaide early that afternoon. 100 litres of avgas was added to its fuel tank from the airport refuelling facilities for the return flight to Port Augusta.

The aircraft departed with the pilot and five passengers on board, but about five minutes into the flight, climbing through 4000ft, the pilot noticed the left hand fuel pressure gauge flickering and immediately turned the left fuel boost pump on which momentarily restored the fuel pressure back to normal. Several seconds later the fuel pressure indication dropped below the red line (minimum pressure) and the engine began to surge and lose power.

The pilot commenced a descent and advised air traffic control that the aircraft was returning to Adelaide. His attention was now directed to the right hand fuel pressure gauge which had also fallen to a low pressure. Turning the boost pump on failed to rectify the problem, and this engine also surged and lost power.

With almost no power available the pilot realised that the distance to Adelaide Airport was too far, so positioned the aircraft for an emergency landing along the coast. He attempted to gain more power by opening the throttles but this only resulted in erratic surging from both engines with a further decrease in power.



It now appeared that the aircraft would not reach the shoreline so the pilot shut down both engines and feathered the propellers to extend the glide. When a landing on the beach was assured he prepared and briefed the passengers for the landing, and to avoid a group of people on the beach delayed extending the landing gear and flaps until the aircraft was clear of their position.

Because of insufficient time for the landing gear to fully extend, the aircraft touched down on the firm sand with the landing gear trailing, and skidded for approximately 200 metres along the beach on its belly.

The pilot and passengers were uninjured and the aircraft received some damage to the rear cabin area lower fuselage skin panels.

The aircraft had been carrying sufficient fuel for the flight, the fuel tank caps were correctly secured and the fuel tank vents were not blocked. Fuel samples taken from the fuel tanker which had recently refuelled the aircraft showed that the correct type of fuel had been supplied, and was not contaminated.

The fuel filters were removed and fuel samples taken from the aircraft for analysis. The filters were found to be blocked by a considerable amount of foreign matter restricting the fuel flow.

Analysis of the fuel samples and sediment indicated that there were no obvious contaminants present which may have been cause for concern.

The particulates present in the samples are always found during testing, being present in the environment and probably introduced during different stages of the fuel handling. The overall amount did not exceed the specification limits.

The particles present in the fuel would not have been responsible for blocking the filters on their own, but would have resulted from the combined effort of a large quantity of individual particulates.

All fuel samples met the specification requirements.

This type of aircraft is unique in that it has only one interconnected fuel tank feeding both engines. Each engine has a 5 micron fuel filter, and a fuel vent system which can allow the ingestion of dust into the fuel tank when the aircraft is operated in dusty conditions.

The aircraft often operates through the channel countries of South Australia and Queensland, a lot of the time in dusty conditions. Refuelling is carried out using drum stock when contaminants could easily be introduced into the fuel system.

The rapid blockage of the fuel filters, which occurred after the aircraft departed, was probably the result of the aircraft fuel system being contaminated over a period of time with an accumulation of extremely fine particles which would have been difficult to detect during water drain checks, and settled forming a sediment at the bottom of the tank. These remained relatively undisturbed until fuel was added to the low level of fuel in the tank, stirring the particles into suspension. This may have concentrated the contamination so that the filters, already partially degraded by contaminants, were further degraded quickly to a point when fuel flow to the engines was severely restricted.

The inherent design weakness of the fuel system in this type of aircraft, including the very fine mesh filters which are intolerant to any fuel contamination, is well known amongst operators, including the operator of this aircraft, who over a long period of time have developed successful control systems and methods for minimising the problem. Immediately following this occurrence the operator instigated more stringent controls and instructions to its pilots concerning the fuel system, and improved quality control for refuelling operations, especially from drum stock

