

**Aviation Safety Investigation Report
198901559**

Piper PA44-180 Seminole

27 October 1989

Readers are advised that the Australian Transport Safety Bureau investigates for the sole purpose of enhancing transport safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purposes.

Investigations commenced on or before 30 June 2003, including the publication of reports as a result of those investigations, are authorised by the CEO of the Bureau in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced after 1 July 2003, including the publication of reports as a result of those investigations, are authorised by the CEO of the Bureau in accordance with the Transport Safety Investigation Act 2003 (TSI Act). Reports released under the TSI Act are not admissible as evidence in any civil or criminal proceedings.

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.

Occurrence Number: 198901559
Location: Kinglake VIC
Date: 27 October 1989
Highest Injury Level: Minor
Injuries:

Occurrence Type: Accident

Time: 932

	Fatal	Serious	Minor	None
Crew	0	0	1	1
Ground	0	0	0	-
Passenger	0	0	1	2
Total	0	0	1	3

Aircraft Details: Piper PA44-180 Seminole
Registration: VH-TVP
Serial Number: 44-7995097
Operation Type: Charter
Damage Level: Substantial
Departure Point: Canberra ACT
Departure Time: 0707
Destination: Essendon VIC

Approved for Release: 17th April 1991

Circumstances:

Shortly after the aircraft passed overhead Eildon Weir in the cruise, the right engine began to run roughly. The pilot carried out appropriate trouble checks but was unable to restore full power to the engine. As he believed that some power was being delivered, he refrained from shutting down the right engine. The pilot realised that the left engine was also deficient in power output. He was in cloud and unable to maintain altitude. Trouble checks confirmed that the right magneto had failed completely whereas with the left magneto selected the engine continued to run roughly. The pilot attempted to divert to Lilydale airfield which was closer than Essendon. While still over the Great Dividing Range, where ground level was about 1800 feet above the sea, the aircraft descended through the cloud base. The pilot suddenly found himself about 35 feet above the trees with rising ground and trees ahead. He managed to carry out a successful forced landing into a ploughed paddock on sloping ground. An on-site examination of the right engine discovered that the sump was overflowing with a mixture of oil and AVGAS. The engine was removed and test run. A carburation problem caused a lean cut. The carburettor was dismantled and revealed excessive play between the float and the support spindle. The fuel valve retractor clip was loose and the valve was scored. The loose retractor clip could move to jam between the float and the spindle support thereby restricting float movement. The scoring on the fuel valve flutes allowed the valve to jam in the valve body thereby restricting fuel flow into the float chamber. It was concluded that the restriction to the float movement, coupled with the jammed fuel valve, had reduced the fuel flow into the float chamber and delivered an increasingly lean mixture to the right engine in flight. The engine at first ran rough but as the fuel level in the float chamber dropped further, the engine ceased delivering significant power. With the throttle wide open, the mixture rich and the fuel boost pump on, it is suspected that either the float or the fuel valve became free again. This could allow fuel to flood the engine causing a rich cut. The engine manufacturer advised that this set of conditions could result in the sump containing AVGAS. A test run of the left engine discovered that its right magneto was inoperative and that the left

magneto was malfunctioning. The main coil lead in the right magneto was found detached from its terminal. The lead was fitted with a flag type terminal that had lost its tension and was capable of slipping off the fixed terminal. The fixed terminal showed evidence of burning and arcing consistent with a loose fit. The left magneto condenser lead had been routed such that it had been rubbing against the magneto cam. The insulation on the condenser wire had worn through exposing bare wires which shorted-out on the cam. This resulted in an intermittent spark which produced rough running and loss of power.

Significant Factors:

1. The right engine failed because of a faulty carburettor.
2. The left engine produced diminished power because both magnetos were faulty.
3. There was insufficient engine power for the aircraft to maintain altitude.
4. The pilot was committed to a forced landing in unsuitable terrain.

Reccomendations:

1. During the investigation it was discovered that the manufacturer of the carburettor, applicable to the PA44, had not provided overhaul agencies with data specific to:- (a) acceptable wear limits for the float assembly (b) the method of setting up the valve retractor clip It is recommended that the CAA review the data available from the carburettor manufacturer.
2. The investigation into the magneto failures showed that the manufacturer's data did not adequately define the way in which the wires were to be routed within the magneto case. It is recommended that the CAA publish explanatory drawings showing the correct routing and highlighting the potential consequences of incorrect routing. It is further recommended that the CAA approaches the manufacturer to have magneto wire routing information distributed, world-wide if appropriate.
3. During the interview with the pilot it was learnt that he had never shut down an engine or feathered a propeller on a twin engine aircraft, even in training. It has been ascertained that there is no legal requirement to shut down an engine or feather a propeller during twin engine endorsement training. It is recommended that the CAA considers engine shut down and propeller feathering as a mandatory exercise in multi-engine endorsement training.