Aviation Safety Investigation Report 199500538

Piper Aircraft Corp Chieftain

26 February 1995

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Aviation Safety Investigation Report

199500538

Occurrence Number: 199500538 **Occurrence Type:** Accident
Location: 26km W Forrest
State: WA **Inv Category:** 4
Date: Sunday 26 February 1995
Time: 1410 hours **Time Zone** WST
Highest Injury Level: None

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-31-350
Aircraft Registration: VH-XMC **Serial Number:** 31-7852055
Type of Operation: Charter Passenger
Damage to Aircraft: Substantial
Departure Point: Forrest WA
Departure Time: 1349 WST
Destination: Kalgoolie WA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL	180.0	2470

Approved for Release: Wednesday, February 7, 1996

[redacted]

The aircraft departed Whyalla for Kalgoorlie, tracking via Olympic Dam to pick up passengers, then Forrest to refuel. Later in cruise, between Olympic Dam and Forrest, the pilot became aware of power fluctuations originating from the right engine which he attributed to a faulty density controller.

At Forrest the aircraft was refuelled to its maximum capacity. After departure the pilot noted that the right engine manifold pressure and RPM indications lagged behind the left engine, and it also failed to obtain correct manifold pressure indications from 4,000 ft above mean sea level (AMSL), and higher.

As the aircraft climbed through 5,000 ft AMSL, approximately 55 km west of Forrest, a passenger attracted the pilots attention to the right engine which he believed was on fire. The pilot noticed smoke and also thought he could see flames so immediately turned the aircraft back towards Forrest, advising Perth Flight Service of the situation. He set the right mixture control to "idle cut-off", then dived the aircraft to increase airspeed. This being a flight manual recommendation as a means to extinguish engine fires.

After descending to about 3,000 ft AMSL the right propeller control was selected to the feather position, but the propeller failed to feather and continued to rotate. The pilot then made several more unsuccessful attempts to feather the propeller, but without having increased power to the left engine the airspeed decayed. The aircraft continued to descend to about 100 ft above ground level (AGL), but with the windmilling right propeller, and now using maximum power on the left engine, the pilot was unable to prevent the airspeed from further decreasing below the best single engine rate of climb speed while attempting to maintain level flight. About 26 km from Forrest the pilot realised that the aircraft would not maintain height any longer and elected to carry out a forced landing.

The aircraft touched down on an uneven rocky surface, then after a ground roll of about 390 metres the landing gear collapsed. The aircraft slide for a further 20 metres, turning through 60 degrees to the right.

The uninjured occupants evacuated the aircraft and walked about a kilometre to the railway line where they hailed and boarded a freight train, which had been alerted to their problem and enabled them to continue their journey to Kalgoorlie.

There were no signs of a fire in the right engine compartment, but there was evidence that a considerable amount of oil had sprayed onto the exhaust pipes and surrounding structure etc near the turbocharger. The engine oil levels had been checked prior to departure from Whyalla, where they both indicated about 11 quarts. After the accident the right engine oil level was found to be 6 quarts.

A test run of the right engine found it capable of developing normal power. Examination of the right turbocharger revealed it had a worn bearing seal which allowed oil to escape during engine operation.

The right propeller blade angles appeared to have been in the normal operating range at impact, and further inspection of the propeller, after disassembly, indicated there was no pre-impact damage which could have prevented it feathering.

Inspection of the aircraft maintenance log books showed that the constant speed unit (CSU) on the right engine had been installed for more than 1,000 hours beyond the approved overhaul period for this type of component. A bench test revealed its feathering operation to be very slow, apparently caused by the speeder spring lift rod being out of adjustment. The propeller pitch control lever was operated several times through its full range while the pilot attempted to feather the propeller, each occasion having the effect of re-starting the slow feathering cycle which possibly allowed the engine RPM to reduce to a speed where the latch mechanism engaged, preventing the propeller blades from moving to the feathered position.

The induction manifold upper deck air sense hose to the turbocharger differential pressure controller was found to be charred, in poor condition and separated from its end fitting at the differential pressure controller attachment.

A partially melted aluminium heat shield, located between the turbocharger and the hose, showed a definite pattern of a hot gas flow in a path from a leaking exhaust flange gasket at the turbocharger to the hose end fitting. This released the clamping pressure of the hose to the end fitting nipple, causing it to separate. The detached hose would have caused the power lagging and reduced manifold pressure as reported by the pilot.

The hose was also found to be covered with oil from the leaking turbocharger seal, which when heated by the exhaust gases may have produced a flame as seen by the pilot and passenger. The smoke was caused by oil spraying onto the hot exhaust pipe surface.

An incorrect empty weight was used on the trim sheet when calculating the weight and balance for this flight, allowing the aircraft to be loaded in excess of its maximum take-off weight on departure from Forrest. This may also have had an influence on the aircrafts inability to maintain height.

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