Australian Government
Australian Transport Safety Bureau

Partial power loss (both engines) involving Piper PA-39, VH-RMA

52 km NW of West Wyalong, New South Wales, 9 December 2012

ATSB Transport Safety Report
Aviation Occurrence Investigation
AO-2012-166
Final – 17 May 2013

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

Power loss (both engines) involving Piper PA-39, VH-RMA

VH-RMA

Source: Charles Taylor Adjusting

What happened

On 9 December 2012, at about 1245 Eastern Daylight –saving Time[1], a Piper PA-39 aircraft, registered VH-RMA (RMA), departed on a private flight from Tamworth, New South Wales for Bacchus Marsh, Victoria. The pilot, the sole person on board, was ferrying the aircraft for a pre-purchase engineering inspection.

As he was unfamiliar with RMA, and the aircraft had not flown for about seven months, the pilot elected to fly via Dubbo and land at Griffith, New South Wales to re-assess the flight.

During the departure and cruise, the pilot took the opportunity to check the handling of the aircraft at different altitudes and profiles. He also operated the engines on different fuel tank combinations[2] and power settings, and spent time testing the auto-pilot functionality.

At about 1530, and 75 NM from Griffith, he prepared for a descent from 4,500 ft above mean sea level (AMSL) to 2,500 ft AMSL. He set the fuel selectors onto the main tanks (Figure 1), reduced the manifold pressure (MAP) on both engines, and left the propeller controls set at 2,300 revolutions per minute (RPM). The pilot increased the MAP on both engines, intending to arrest the descent and fly level, as the aircraft approached 2,500 ft AMSL. He then noticed an uncommanded decrease in the left engine RPM to 2,000. He moved the left propeller lever to the maximum position of 2,700 RPM; however, the RPM failed to respond, staying at 2,000, and the aircraft continued to descend.

The pilot initiated the emergency checklist by moving the left engine mixture control to the full rich position, the throttle to the maximum MAP and turned on the fuel pump. The left engine was unresponsive and the aircraft continued to descend. To utilise all available power, he commenced the emergency checklist for the right engine. Almost immediately, the right engine began to vibrate severely, with a noticeable loss of power, and an increased rate of descent.

Concerned about the aircraft's proximity to the critical V_{mca}[3] airspeed (70 kt), the pilot maintained about 90 kt, while searching for a suitable landing site. He commenced an approach and broadcast the aircraft's position and his intentions on the Melbourne Centre frequency. On final approach, he turned off the fuel pumps. During the round-out, he decided to extend the landing gear, as the surface looked more suitable than first thought. He pulled back on the control column to gain height and selected the landing gear down. The aircraft stall warning briefly sounded, so the pilot lowered the aircraft nose. Moments later, the propellers contacted the ground and the aircraft skidded to a halt.

The pilot secured the aircraft, broadcast his situation and exited the aircraft. The pilot was uninjured and the aircraft sustained serious damage.

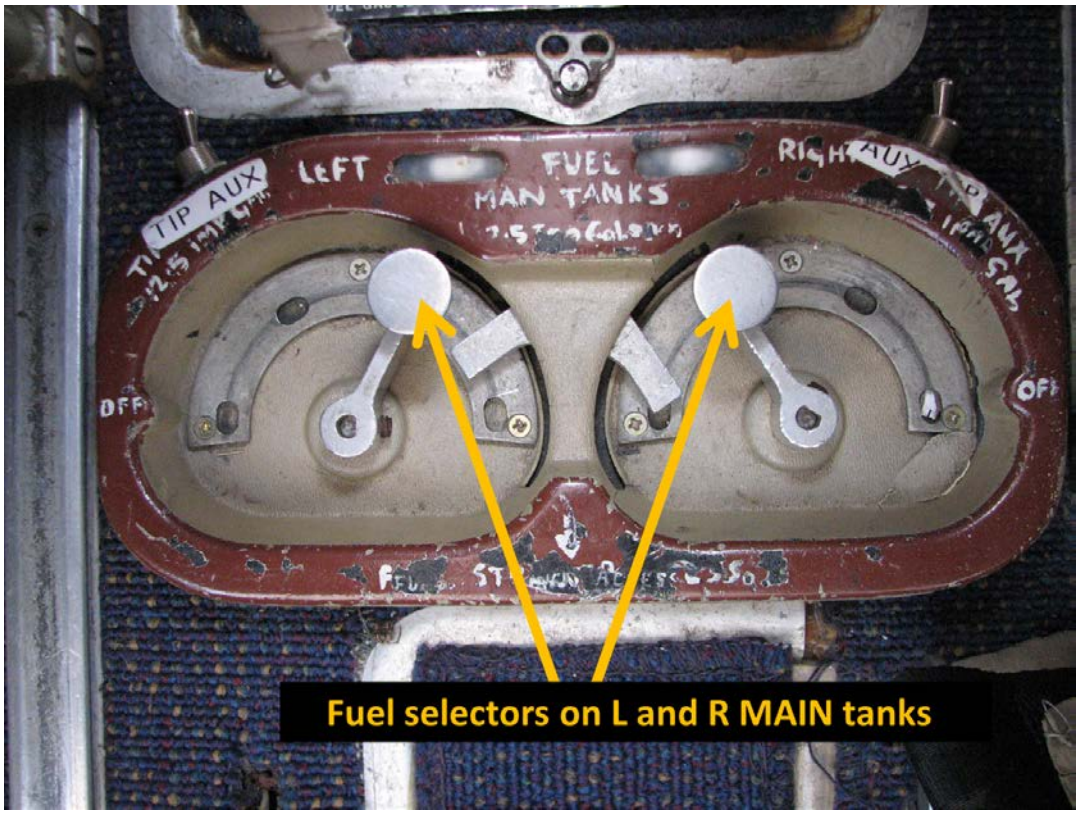
---

1 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

2 RMA had three fuel tanks for each engine (main, auxiliary and tip tanks) and cross feed capability.

3 V_{mca} is the minimum flight speed at which an aircraft with an engine mounted on each wing is controllable with a maximum 5° bank toward the operative engine, when the critical engine suddenly becomes inoperative with the remaining engine operating at take-off power. The value presented represents the most critical combination of power, weight, and centre of gravity.

Figure 1: VH-RMA fuel selectors



Source: Charles Taylor Adjusting

Pilot experience and comments

The pilot held a Private Pilot (Aeroplane) Licence with about 2,400 hours total time and 1,918 hours on type.

The pilot, assisted by an engineer, reported conducting a full pre-flight inspection of the aircraft. He did recall, however, that he was distracted during this inspection and did not keep to his normal routine. This departure from routine included not dipping the fuel tanks prior to adding fuel, as there was no dipstick available.

The pilot recalls completing the following pre-flight items:

- checking the oil quantity, with the maximum 8 quarts of oil in each engine
- all fuel tanks were filled to the level of the filler neck - using 223 L of fuel from the bowser
- checking the fuel tanks for water and contamination after refuelling
- noting the right fuel cap was very loose in sealing. Although the cap fitted okay after refuelling, he noted the rubber seal needed replacing
- during pre-start checks, he found the left tip tank solenoid valve not operating. He endorsed the maintenance release with this unserviceability as this prevents fuel from being transferred from the left tip tank, rendering fuel in the left tip-tank unuseable
- during the initial engine run-up there was a 150 RPM drop[4] on the right magneto of the left engine. After some power test runs, this reduced to about a 90 RPM drop prior to takeoff

[4] The maximum acceptable drop was 175 RPM.

Aircraft details

The last 100-hourly maintenance check had been conducted on 9 January 2012 at 4,561.4 hours, about 16 flight hours prior to the accident. The aircraft had not been flown for about seven months.

The pilot reported the maintenance release had been endorsed with an operational restriction. This limitation restricted the aircraft to only operations under the aerial work category and visual flight rules (VFR) until the left engine magnetos were overhauled.

The following technical details were taken from a generic Information Manual and Flight Manual for a PA-39 C/R, the same type as RMA.

> All fuel cells are equipped with fuel caps that periodically need to be inspected for proper sealing. Fuel cells should be kept full of fuel during storage and the aircraft refuelled as soon as possible after each flight to prevent accumulation of moisture and deterioration of the cells. For storage of more than ten days without fuel, the cells should be coasted with light engine oil to prevent excessive drying.

The oiling of the fuel cells applies only to the main and auxiliary tanks.

Aircraft examination

An insurance representative attended the accident site (Figures 2 and 3) and noted that there was sufficient fuel remaining in the main fuel tanks to complete the flight. An assessment for contaminants such as water could not been undertaken at the accident site. The reason for the reported performance loss on either engine could not be definitively determined.

Figure 2: Accident site

Figure 3: Accident site

Source: Charles Taylor Adjusting

Safety message

The Australian ‘Tribe’ of the International Comanche Society maintain a website for pilots who fly or maintain an interest in Comanche aircraft such as RMA. This keeps readers up to date with Civil Aviation Safety Authority (CASA) airworthiness directives, and any other maintenance issues for the Comanche series of aircraft. They also conduct pilot proficiency programs on the type. Further information is available at www.comancheflyer.com.au.

An article titled, ‘That was then, this is now’ highlights the need to take into consideration performance loss as an aircraft ages. This is available in the January-February 2013 edition of *Flight Safety Australia* at www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_101369.

General details

Manufacturer and model:	Piper Aircraft Corporation PA-39	
Registration:	VH-RMA	
Type of operation:	Private	
Primary occurrence type:	Engine(s) – Partial power loss	
Location:	52 km north-west of West Wyalong, New South Wales	
	Latitude: 33° 36.43' S	Longitude:146° 47.18' E
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Serious	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.