SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/9952						
Classification	Accident	**Date**	4 September 2021	**Time**	1106Z		
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Numbi Airstrip near Hazyview, Mpumalanga Province	Place of Intended Landing	Da Gama Dam near White River, Mpumalanga Province				
Place of Accident	5nm south of Numbi Airstrip						
GPS Co-ordinates	Latitude	25°05'50.68"S	Longitude	031°04'26.0" East	Elevation	2621ft	
Aircraft Information							
Registration	ZU-DVG						
Model/Make	Bantam B22J (Serial Number: 05268)						
Damage to Aircraft	Substantial	Total Aircraft Hours	3659.7				
Pilot-in-command							
Licence Valid	Yes	Gender	Male	Age	76		
Licence Type	National Pilot Licence (NPL)						
Total Hours on Type	±6890	Total Flying Hours	+7005.2				
People On-board	1+1	Injuries	1	Fatalities	0	Other (on ground)	0

What Happened

On Saturday morning, 4 September 2021 at approximately 1100Z, a pilot and a passenger on-board a Bantam B22J aircraft with registration ZU-DVG took off from Numbi Airstrip near Hazyview, destined for Da Gama private airstrip near White River in Mpumalanga Province. The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended. Clear weather conditions prevailed at the time leading to the accident.

The pilot stated that approximately 5 nautical miles (nm) south of Numbi Airstrip at 800 feet (ft) above ground level (AGL) the engine spluttered and eventually stopped. The pilot searched for a spot to execute a forced landing; he identified a ploughed field between banana plantations, however, the aircraft lost height quickly and was unable to reach the identified field. During the forced landing, the aircraft struck some banana trees before coming to a halt. After the aircraft had

stopped, the pilot checked on the passenger's well-being and switched off the fuel supply and master switch before vacating the aircraft (with the passenger). The pilot called his friend for help using his mobile phone.

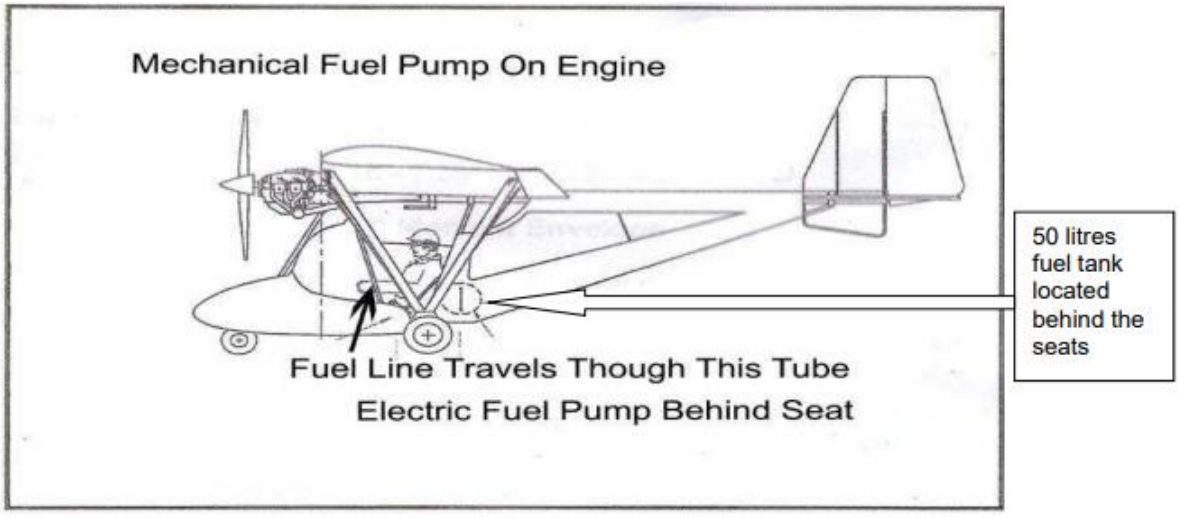
The aircraft sustained substantial damage. The passenger was not injured, however, the pilot suffered minor injuries to his back during the accident sequence.

The accident occurred during day light approximately 5 nautical miles (nm) south of Numbi Airstrip at Global Positioning System (GPS) co-ordinates determined to be 25°05'50.68" South 31°04'26.0" East and at an elevation of 2621 feet (ft).

Figure 1: Accident location 5nm south of Numbi Airfield. Orange arrow shows direction of flight. (Source: Google Earth)

According to the pilot, on 4 September 2021, he refuelled the aircraft with 25 litres of Unleaded Octane 95 to make a total of 50 litres, which translated to 150 minutes of endurance. The pilot conducted a scenic flight on 4 September 2021 which lasted for about 30 minutes. Approximately 10 litres of fuel was burned during the scenic flight. At the beginning of the accident flight, the aircraft had 40 litres of fuel in the tank. Fuel remaining inside the tank after the accident flight was 35 litres; the accident flight lasted approximately 5 minutes. The pilot stated that he buys fuel from a Sasol filling station in Hazyview using approved 25-litre jerry cans and refuels the aircraft using a funnel that has a microscopic filter that can detect water and separate it. According to the flight manual, the fuel pump is an on-condition component. According to the airframe logbook, the fuel pump was inspected during the 75-hour inspection on 21 March 2021 at 3552.9 airframe hours.

The aircraft has a 50-litre fuel tank located behind the seats. Fuel travels from the fuel tank to the secondary electric pump behind the seats at the same level as the tank output. It then goes to the fuel line and then to the gascolator. From there, it goes through the tap and into the primary fuel pump on the motor before it goes to the carburettor. The fuel specified for this engine is either Avgas 100/130 (preferred) or Mogas with an octane rating of 95 or above.



The last annual inspection was conducted on 23 August 2021 at 3654.6 airframe hours. The aircraft had flown a total of 5.1 hours since its last annual inspection. The aircraft was issued a Certificate of Release to Service (CRS) on 23 August 2021 with an expiry date of 22 August 2022 or at 3754.6 hours, whichever occurs first. There were no pre-existing failures prior to the accident; all damage was a result of the accident. Records indicated that the aircraft was airworthy and there were no recorded defects prior to the flight.

The approved person reported that after strip down, cleaning and inspection of the engine, it was found that the possible cause of engine failure was due to the mechanical fuel pump inefficiency. As the pilot had shut down the electrical fuel pump, he was dependent on the primary mechanical pump. There was evidence of sludge inside the mechanical fuel pump, which is likely to reduce pumping ability (see Figure 5-7). Cylinder number 2 failed a Cold Blow By test by 50/80; the minimum is 60/80. The fuel filter was in good condition and there were no particles in the fuel found in the carburettor bowl.

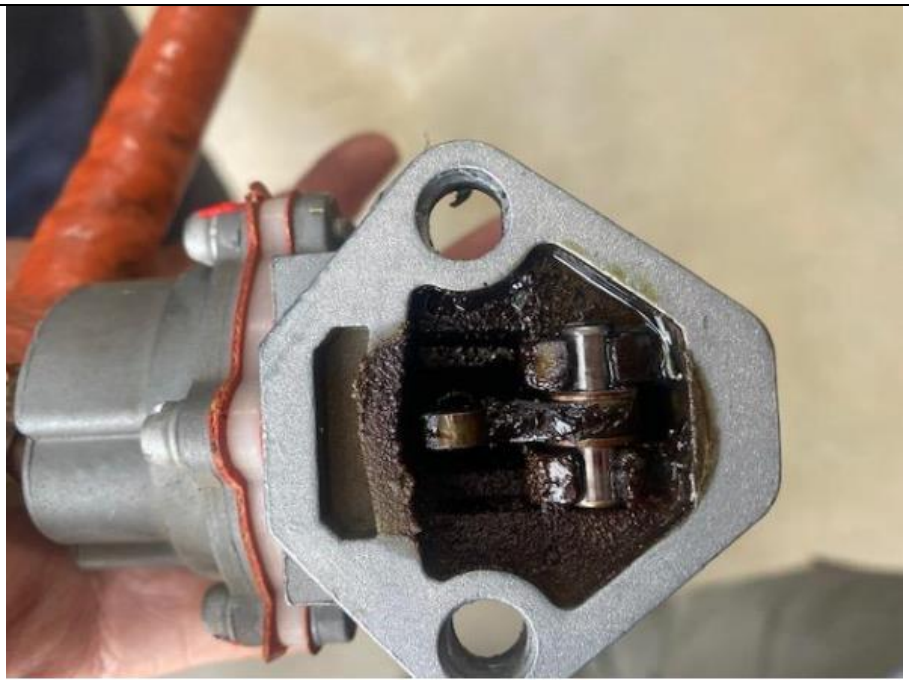


Figure 2: Visible sludge inside the mechanical fuel pump.

Figure 3: Mechanical fuel pump with sludge.

Figure 4: Sludge in the mechanical fuel pump.

What was found:

The findings of the failed engine at the maintenance facility revealed that the possible cause of engine failure was the sludge in the mechanical fuel pump which blocked fuel flow, thus, starving the engine (of fuel). The cause of the sludge could not be determined. The aircraft fuel flow was dependent on the primary mechanical fuel pump. There was sludge in the mechanical fuel pump which likely reduced pumping (flow) ability (see Figure 3 and 4). According to the airframe logbook, the mechanical fuel pump was inspected during the 75-hour inspection on 21 March 2021. The mechanical fuel pump is an on-condition component. The electric fuel pump was found in good condition.

Probable cause:

Unsuccessful forced landing as a result of engine stoppage in-flight due to fuel starvation caused by sludge in the mechanical fuel pump.

Safety Action/s

None.

Safety Message and/or Safety Recommendation/s

None.

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to apportion blame or liability****.*

About this Report
Decisions regarding whether to investigate, 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, no investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar accident. *This report provides an opportunity to share safety message/s in the absence of an investigation.* *All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.*
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This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa