SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigation Division** Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9253		
Aircraft registration	**ZU-CLM**	**Date of accident**	9 December 2013		**Time of accident**	1312Z	
Type of aircraft	Bushbaby (Aeroplane)		**Type of operation**		Private		
Pilot-in-command licence type		Commercial	**Age**	27	**Licence valid**	Yes	
Pilot-in-command flying experience		Total flying hours	744,4		Hours on type	67,1	
Last point of departure	Nelspruit Aerodrome (FANS), Mpumalanga province						
Next point of intended landing	Nelspruit Aerodrome (FANS), Mpumalanga province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
300 m short of the threshold of runway 04 at FANS (GPS position: 25°30'20.57" South 030°54'42.84" Ea st)							
Meteorological information	Surface wind: 040°/5 kt, temperature: 22 °C, visibi lity: +10 km						
Number of people on board	1 + 1	**No. of people injured**	1		**No. of people killed**	0	

Synopsis

The pilot, accompanied by an aircraft maintenance technician, conducted a post-maintenance acceptance flight on the aircraft following an abnormally high engine water temperature indication during flight, which was a recurring event on this aircraft.

After being airborne for approximately 20 minutes, they returned to the aerodrome (FANS), where they flew one touch-and-go onto runway 04 and were positioning for a second, but had to extend their downwind due to traffic in the circuit. While on a long final approach for runway 04, the engine as well as the propeller stopped. The pilot attempted twice to restart the engine but was unsuccessful. He then selected an open grass field straight ahead where he could perform a forced landing.

Shortly after touchdown the nose wheel collapsed and the left main gear collapsed partially. This caused the aircraft to come to a halt with the left wing and the nose down, resulting in substantial damage to the aircraft. The passenger, who was seated in the right front seat, injured his left knee and was taken to a medical facility for a check-up. The pilot was not injured in the accident.

Probable cause

Unsuccessful forced landing following an engine stoppage in flight.

ASP Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner	**:** J.Q. Bestwick
Name of Operator	**:** Private
Manufacturer	**:** Kitplanes for Africa
Model	**:** Bushbaby
Nationality	**:** South African
Registration Marks	**:** ZU-CLM
Place	**:** Nelspruit aerodrome
Date	**:** 9 December 2013
Time	**:** 1312Z

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.

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) 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 establish legal liability****.*

Disclaimer:

This report is produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of flight

1.1.1 The aircraft had been experiencing abnormal high water temperature indications during flight. Following a maintenance intervention to try and rectify the problem, which had been recorded five times before, the pilot, accompanied by an aircraft maintenance technician, conducted a post-maintenance acceptance flight on the aircraft.

1.1.2 According to a statement by the pilot he performed a detailed pre-flight inspection of the aircraft. He checked the fuel state visually, which can be seen from the inside of

the cockpit, and found that there was sufficient fuel for the flight; according to his estimate the collective fuel state was approximately 25 litres, with one tank being one quarter full and the other tank approximately one eighth, which was sufficient for the flight. The intended flight time was approximately 30 minutes. With an average fuel consumption of 15 litres per hour, they would consume approximately 8 litres of fuel (including start, taxi and take-off) for the flight in question, which would have been well within the fuel reserves of the aircraft.

1.1.3 After take-off from runway 04 at FANS he turned out right and remained to the east of the aerodrome for approximately 10 minutes, where they assessed the engine operation. They then return to the aerodrome, where they conducted a touch-and-go on runway 04. Due to other traffic in the circuit they had to extend their downwind leg before they were able to conduct a second touch-and-go. After roll-out of the turn, being positioned on a long final approach for runway 04, there was a rapid decay in engine RPM (revolutions per minute) followed by an engine stoppage. The engine did not splutter prior to the stoppage. The propeller did not windmill and came to an immediate stop when the engine stopped.

1.1.4 The pilot attempted to restart the engine twice, but was unsuccessful. He then focused on selecting a suitable open area in order to conduct a forced landing, as he knew they would not be able to glide all the way to the runway. After he had selected a field, he notified the ATC of his intended forced landing by broadcasting “Emergency”.

1.1.5 The aircraft touched down on an open, grass-covered area approximately 300 m short of the threshold of runway 04. During touchdown the nose wheel collapsed and the left main landing gear support strut failed, resulting in a partial collapse of the left main gear. The aircraft came to a halt with the nose down and the left wing low (the left wing tip made contact with the ground). Prior to evacuating the aircraft they closed both fuel shut-off levers (one on each side, left and right wing tanks) and switched off the magnetos as well as the master switch.

1.1.6 The technician, who was seated in the right front seat, injured his left knee during the forced landing and was taken to a medical facility for a check-up. The pilot was not injured in the accident.

1.1.7 The accident occurred during daylight conditions at a geographical position that was determined to be 25°30’20.57” South 030°54’42.84” East at an elevation of 2 853 feet above mean sea level (AMSL).

Figure 1. A Google earth image indicating the location of the accident (ZU-CLM) with reference to the runway

1.2 Injuries to persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	1	-
None	1	-	-	-

1.3 Damage to aircraft

1.3.1 The aircraft sustained substantial damage during the forced landing when the nose wheel collapsed and the left wing impacted with the ground.

1.4 Other damage

1.4.1 No other damage was caused.

1.5 Personnel information

1.5.1 Pilot-in-command

Nationality	South African	Gender	Male	Age	27
Licence number	0271066854	Licence type	Commercial		
Licence valid	Yes	Type endorsed	Yes		
Ratings	Instrument rating, Instructor grade II, Flight test multi-engine piston.				
Medical expiry date	31 July 2014				
Restrictions	None				
Previous accident	None				

Flying experience:

Total hours	744,4
Total past 90-days	70,4
Total on type past 90-days	16,0
Total on type	67,1

1.6 Aircraft Information

Airframe:

Type	Bushbaby	
Serial number	66	
Manufacturer	Kitplanes for Africa	
Year of manufacture	2001	
Total airframe hours (at time of accident)	302,6	
Last annual inspection (hours & date)	286,4	26 August 2013
Hours since annual inspection	16,2	
Authority to Fly (issue date)	5 September 2013	
Authority to Fly (expiry date)	25 August 2014	
C of R (issue date) (present owner)	4 September 2012	
Operating categories	Owner Training	

Engine:

Type	Rotax 912 ULS
Serial number	4426828
Hours since new	302,6
Hours since overhaul	T.B.O. not yet reached

Propeller:

Type	P-Prop
Serial number	N2533FE
Hours since new	302,6
Hours since overhaul	T.B.O. not yet reached

1.6.1 The aircraft weight and balance fell within the approved take-off weight of 500 kg as stipulated in the flight manual. The aircraft empty weight was 315 kg; the pilot weighed 69 kg and the passenger 75 kg, which amounts to 459 kg, leaving 41 kg for fuel. From information contained in the report, the fuel weight was well below 41 kg.

1.7 Meteorological information

1.7.1 Weather information was obtained from FAKN air traffic control (ATC) at the time the accident was reported as well as from the pilot questionnaire.

Wind direction	040°	Wind speed	5 kts	Visibility	+ 10 km
Temperature	22 ℃	Cloud cover	6/8	Cloud base	4 500’
Dew point	Unknown				

1.8 Aids to navigation

1.8.1 The aircraft was equipped with standard navigational aids as approved by the regulator.

1.9 Communication

1.9.1 The aircraft was equipped with standard communication equipment as approved by

the regulator.

1.9.2 The pilot broadcast a distress call on the aerodrome VHF frequency 125.20 MHz following an engine stoppage in flight.

1.10 Aerodrome information

Aerodrome location	4 nm SW of the city	
Aerodrome co-ordinates	25°03.80 South 030°54.42 E ast	
Aerodrome elevation	2 901 feet	
Runway designations	04/22	
Runway dimensions	1 042 x 18 m	
Runway used	04	
Runway surface	Asphalt	
Approach facilities	Landing lights	
Aerodrome status	Licensed	

*NOTE: Runway availability:
Landings – Runway 22 only,
Take-off – Runway 04 only, except in strong southerly wind conditions.

1.11 Flight recorders

1.11.1 The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor was it required to be fitted to this aircraft type according to the regulations.

1.12 Wreckage and impact information

1.12.1 The pilot executed a forced landing on an open field approximately 300 m from the threshold of runway 04. During the landing the nose wheel collapsed and the left main landing gear strut collapsed partially (as can be seen in figure 2 on the next page). The aircraft came to a halt with the nose down and the left wing low, resulting in substantial damage to the lower engine, the engine cradle and the outer section of the left wing.

Figure 2 View of the aircraft as it came to rest

Figure 3. View of the collapsed nose gear and engine damage

1.13 Medical and pathological information

1.13.1 Not applicable.

1.14 Fire

1.14.1 There was no pre- or post-impact fire.

1.15 Survival aspects

1.15.1 The accident was survivable due to the low kinetic forces associated with the impact sequence. Both occupants were wearing the aircraft's safety harnesses during the flight. The cockpit cabin area remained intact. The passenger who was seated in the right front seat did injure his knee during the forced landing.

1.16 Tests and research

1.16.1 Following the recovery of the aircraft to an aircraft maintenance organisation (AMO) at FANS the fuel was drained from the two wing tanks. Approximately 5 litres was drained from the right tank and 10 litres from the left tank. It was further noted that the fuel grade differed between the right and left tank. The fuel in the right tank would appear to have been mogas; it was much darker in colour and smelled different from the fuel in the left tank, which was a mixture of mogas and avgas but predominantly avgas. According to the CAA approved flight manual for this aircraft the total fuel capacity was 72 litres (36 litres per tank), with the unusable fuel indicated as 5 litres (see Annexure A attached to this report).

Figure 4. The two containers with the fuel that was drained from the tanks

1.16.2 The header tank (see figure 5 below) was removed from its location in the cockpit/cabin area and was found not to contain any fuel. Fuel flows by gravity from the two wing tank outlets, which are located aft of the tank; it then passes through a fuel filter (one on each side) and flows to the header tank, which on this aircraft contained approximately 500 ml of fuel and was located against the forward firewall in the cockpit/cabin area. From the header tank, fuel was supplied to the engine via a mechanical fuel pump. (A newly designed header tank was installed on later models of this aircraft type and contained 5 litres of fuel).

Figure 5. The header tank against the firewall in the cockpit

1.16.3 The propeller was not damaged in the accident, as it came to a stop in a horizontal position prior to ground impact. The engine could be turned freely by hand. In a post-accident inspection on the engine, the fuel lines connecting to the fuel pump (inflow and outflow lines) were removed and were found not to contain any fuel. Both carburettor bowls were removed and showed no signs of fuel. Both fuel filters were removed and cut open; neither of them contained any fuel, but they displayed very slight traces of dirt (photo of one of the filters can be seen on the next page, figure 6). The spark plugs were removed and displayed a light greyish colour, which was indicative of normal engine operation. A compression test was performed on the engine, and no abnormalities were noted on any of the four cylinders.

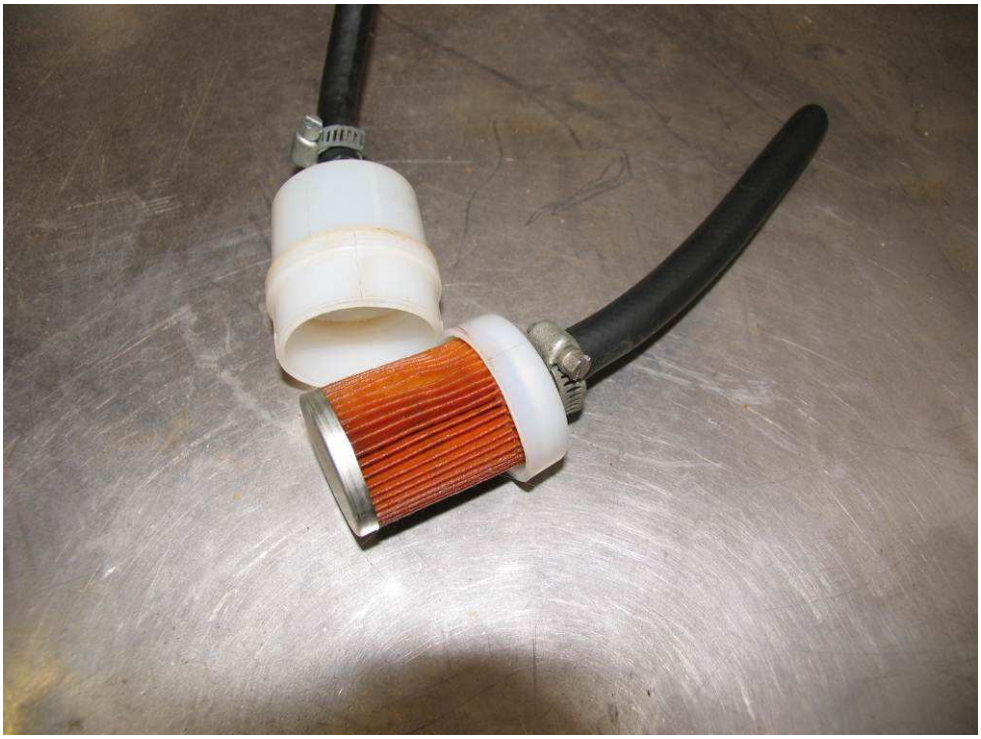

Figure 6. View of one of the fuel filters that was cut open

1.16.4 The fuel drains from both the wings tanks were inspected. It was found that both drains leading to the airframe/engine were positioned at the back of the tank, as can be seen in figure 7. From the wing tank the fuel flows through a filter (automotive type) as depicted in figure 6 and figure 9, and from there via the fuel shut-off lever (visible in figure 9) to the header tank and from there to the engine. According to the aircraft flight manual, if both fuel valves are in the open position simultaneously, the fuel will always feed from the left wing tank first. The fuel quantity in the wing tank can only be observed via a view hole cut in the presswood panelling from inside the cockpit during flight. The fibreglass material used in manufacturing the fuel tank has a brownish colour, which does restrict the pilot's view of the fuel quantity during flight. During the investigation it was found that certain models of this aircraft type were equipped with a fuel tank inspection light, located at the bottom of the wing tank, which the pilot can switch on during his/her pre-flight or during flight for a brief period. This gives the pilot a much clearer view of the actual fuel quantity in the tank.

Figure 7. View of the fuel drain pipe from the right wing tank

1.16.5 In the photo below (figure 8) the fuel quantity indication of 10 litres can be seen written by hand on the inside of the fuel tank with a black permanent marker. This indication should be visible to the pilot during flight via the view panel. It is evident that the white paint was sprayed over the entire wing tank side surface and a patch was cleaned afterwards in order to provide the pilot with some sort of view of the fuel level. It should be kept in mind that this is a high wing aircraft, therefore the pilot has to look upward and to the side, either to his/her left or right, to try and make an accurate assessment of the fuel level. On this aircraft the pilot's view was restricted by the brownish colour of the fibreglass.

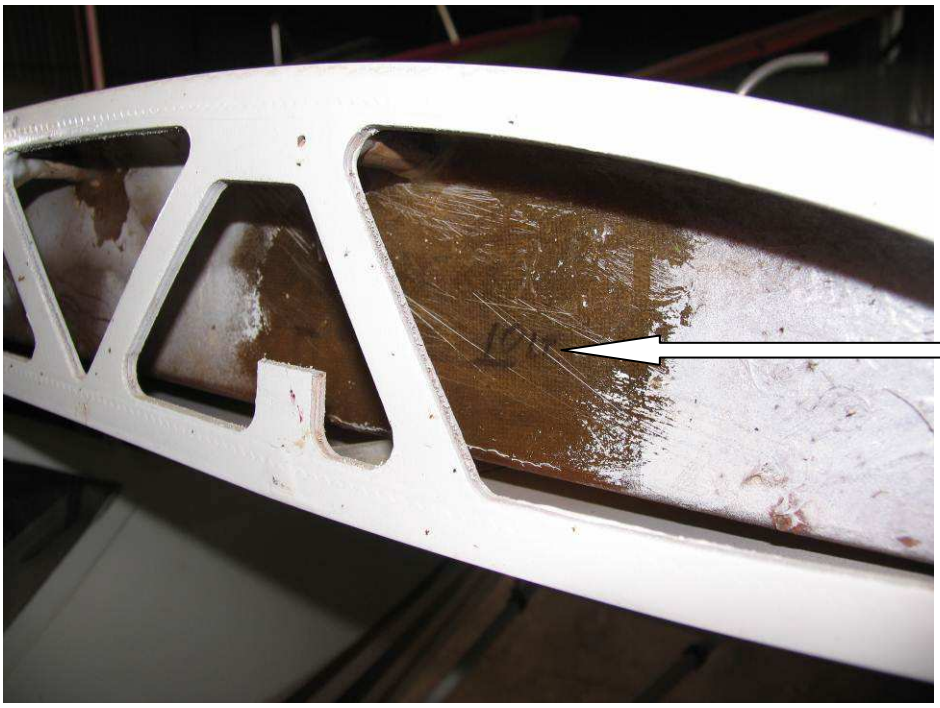

Figure 8. Fuel quantity indication written on the inside of the wing tank

Figure 9. Fuel tank quantity view panel taken from inside the cockpit (right wing)

1.17 Organisational and management information

1.17.1 This was a private flight.

1.17.2 The AMO that conducted the last maintenance on the aircraft prior to the accident flight was in possession of a valid AMO approval certificate that was issued by the

regulating authority on 28 March 2013. The certificate was valid for a period of one year.

1.18 Additional information

1.18.1 Pilot interview

During an interview with the pilot he admitted that he had added fuel to the left wing tank of the aircraft after the accident occurred. Following the arrival of several pilots on the accident scene (the accident being in close proximity to the aerodrome), they immediately questioned the aircraft's fuel state and indicated that if it did not meet the minimums as stipulated in the Regulations, there might be a problem with regard to the insurance. He admitted that he was severely traumatised by the accident, and without applying his mind he drove to the aerodrome in one of the pilot's vehicles that arrived on the scene and went to the hangar of the organisation that maintained the aircraft. In the hangar he obtained a plastic 20-litre container that contained some fuel (Avgas). The actual amount of fuel that was in the container he could not recall, but the container was not full. He then returned to the accident scene and emptied the fuel into the left wing tank, which was the most accessible tank of the two due to the attitude of the aircraft (left wing being in contact with the ground). The pilot admitted in a written statement that he realised that his actions were in contravention of Part 12.04.4(1) of the CARs, Interference with objects on the scene of an accident: *"(1) Subject to the provision of this part, no person shall interfere with an aircraft which has been involved in an accident, the wreck or wreckage, a part or component thereof or anything transported therein or any marks resulting from the accident which may be of assistance in an investigation".*

1.18.2 Civil Aviation Regulations of 2011

Part 91.07.12 (Fuel Supply)

"(1) The pilot shall not commence a flight unless he or she is satisfied that the aircraft carries at least the planned amount of fuel to complete the flight safely, taking into account operating and meteorological conditions and the expected delays.

(2) The PIC shall ensure that the amount of usable fuel remaining in flight is not less than the fuel required to proceed to an aerodrome or, in the case of a helicopter, a suitable landing place, where a safe landing can be made.

(3) If the useable fuel on board the aircraft is less than the final reserve fuel, the PIC of such aircraft shall –

(a) in the case of an aeroplane, declare and emergency; or

(b) in the case of a helicopter, land as soon as possible.

(4) The method of calculating the amount of fuel to be carried for each flight shall be as prescribed in Document SA-CATS-91".

1.18.3 SA-CATS-91

Fuel Supply – Planning criteria for aeroplanes (91.07.12)

"Except as provided in Part 91, Part 121 and Part 135, an owner or operator must base the fuel policy, including calculation of the amount of fuel to be carried by an aeroplane, on the following planning criteria –

(3) when the flight is conducted in accordance with the visual flight rules by day, flight to the aerodrome of intended landing and thereafter for at least 30 minutes at the normal cruising altitude consumption rate";

1.19 Useful or effective investigation techniques

1.19.1 None.

2. ANALYSIS

2.1 Man (Pilot)

The pilot was found to be properly licensed for the flight. The role of the pilot on this flight was to perform a post-maintenance acceptance flight following an engine

overheating problem (this being a water-cooled engine). The pilot had conducted a detailed pre-flight inspection of the aircraft prior to the flight, including a check of the fuel quantities of each tank from inside the cockpit via the wing tanks view panels, of which there was one on each side, and found the aircraft to be safe for flight. From his observation he estimated the fuel quantity that was available in the two tanks to be approximately 25 litres, which was sufficient for the intended flight with an estimate duration of 30 minutes. Taking into consideration the average fuel consumption for this engine, which was approximately 15 litres per hour, the fuel on board should have been more than sufficient for the intended flight. The pilot did not check the fuel quantity via the dipstick method (opening the refuelling caps with the aircraft in a level attitude and measuring the fuel content by means of a dipstick/measuring stick), which provides for an accurate measurement; instead he relied on the observations he made from inside the cockpit, and on that basis he continued with the flight. While on a long final approach for runway 04 the engine and propeller stopped. The pilot attempted twice to restart the engine, but without success. He was left with no other option but to execute a forced landing in an open field he had identified from the air, as he was unable to stretch the glide to the runway.

2.2 Machine (Aircraft)

The aircraft had an engine overheating problem (being water cooled), and an aircraft maintenance organisation was asked to rectify the problem. Maintenance was performed and a post-maintenance acceptance flight was required in order to make a proper assessment of whether the maintenance intervention had solved the problem, as it was a recurring problem. During the flight the water temperature remained within the normal engine operating range. However, the engine stopped while the aircraft was positioned on a long final approach for a runway 04. Two attempts to restart were unsuccessful. A post-accident inspection on the engine revealed that the engine did not stop due to a mechanical malfunction. No fuel was present in the fuel lines to and from the fuel pump, nor was there any fuel in the carburettor bowls or the header tank. An engine bench test was not possible due to impact damage. Fuel was drained from the two wing tanks after the aircraft had been recovered to a maintenance facility. The right tank contained 5 litres and the left tank 10 litres of fuel. The pilot, however, indicated in a statement to the investigating authority that he had added fuel to the left wing tank after the accident, prior to the recovery of the aircraft from the site. This fuel was contained in a 20-litre container (the quantity in the container was unknown) that was in the AMO

hangar at FANS. This was an instinctive reaction by the pilot, as he had been questioned by several other pilots who arrived on the scene and learnt that if the fuel state was found not to meet the regulatory requirements, it might be problematic. He used the vehicle of one of the pilots who had arrived on scene to drive to the hangar and collect the 20-litre container that contained some fuel (the actual amount was not known).

In paragraph 1.16.4 of this report, the investigator mentions that a number of these aircraft were equipped with fuel tank lights installed in the bottom of each wing tank. This light was fitted to assist the pilot to make a much more accurate observation of the fuel quantity in the tank. The light can be switched on for a brief period during the pre-flight inspection as well as during a flight. This modification indicates that an improvement was essential in order for the pilot to make an accurate assessment of the fuel quantity remaining in the tank(s) and that the initial design had a shortcoming. It was further noted that the aircraft was not equipped with a low fuel quantity warning system, which made it all the more important to ensure that the fuel quantity in the tanks was clearly visible to the pilot.

2.3 Environmental

Fine weather conditions prevailed at the time of the flight and weather was not considered to have had any bearing on the accident.

2.4 Mission

The intended flight was nothing out of the norm. The pilot was appropriately qualified to conduct the flight and the aircraft was found safe for flight.

2.5 Conclusion

The pilot stated that he observed one tank to be approximately ¼ full, which equates to 9 litres, and the other tank to be about one eighth full, which equates to approximately 4,5 litres of fuel. This does not add up to 25 litres (as indicated by the pilot), but to approximately 13,5 litres; the combined fuel state was therefore miscalculated. The fuel consumption for this engine was indicated to be 15 litres per hour, and according to the pilot questionnaire they were airborne for 30 minutes (from take-off until the accident). During this period of flight approximately 8 litres of fuel was consumed, which would have left a total of approximately 5,5 litres of fuel in the tanks (collective fuel state). Five litres of fuel was drained from the right tank,

which is the amount of unusable fuel indicated in the aircraft flight manual (which is attached to this report as Annexure A). Unfortunately the fuel quantity that remained in the left tank could not be determined with accuracy, as the pilot had collected fuel from a maintenance hangar in a 20 litre container and emptied the content of the container into the left wing tank on the scene of the accident. The fuel that was drained from this tank following recovery of the aircraft was 10 litres. Taking into consideration that the left tank will feed first (as indicated in the aircraft flight manual attached to this report as Annexure B) and the two tanks do not feed simultaneously, the engine most probably stopped in flight due to fuel exhaustion when the fuel content in the left tank was depleted and the 5 litres of unusable fuel remained in the right tank. It is therefore highly unlikely that there ever was 25 litres of fuel on board the aircraft prior to the flight. The fuel tank quantity indications as tabled by the pilot therefore are deemed the more accurate version of the two submitted in his statement. The fact that it was not possible to restart the engine indicates that no fuel was being supplied to the engine, hence the engine stoppage. The interference by the pilot by adding fuel to the left wing tank jeopardised the investigation process, as an accurate assessment of the fuel remaining in the left tank was essential in order to substantiate this conclusion.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot was the holder of a valid commercial pilot's licence and had the aircraft type endorsed on his licence.

3.1.2 The pilot was the holder of a valid aviation medical certificate that was issued by a CAA-approved medical examiner.

3.1.3 The pilot did broadcast an emergency on the local aerodrome frequency prior to the forced landing.

3.1.4 The pilot admitted that he left the scene of the accident, went to the aerodrome (maintenance hangar), collected a 20-litre container with some fuel and emptied the fuel into the left wing tank. This interference by the pilot jeopardised the investigation.

3.1.5 The aircraft was in possession of a valid authority to fly at the time of the accident.

3.1.6 According to the pilot's statement there was approximately 25 litres of fuel on board the aircraft prior to take-off, which would have been adequate for a 30-minute flight. However, he also stated that one tank was ¼ full and the other one eighth full, which comes to a total of 13,5 litres and not 25 litres. These two statements are contradictory.

3.1.7 The aircraft was not equipped with a low fuel warning system.

3.1.8 The engine stoppage could not be attributed to a mechanical failure.

3.1.9 There was no evidence of fuel in the fuel lines to and from the fuel pump, neither was there any fuel in the carburettor bowls or the header tank.

3.2 Probable cause

3.2.1 Unsuccessful forced landing following an engine stoppage in flight.

3.3 Contributory factor/s

3.3.1 The engine stoppage could be attributed to fuel exhaustion.

3.3.2 Difficulty for the pilot to make an accurate assessment of the fuel quantity remaining in the respective tanks due to poor design.

4. SAFETY RECOMMENDATIONS

4.1 It is recommended to the Director of Civil Aviation that the fuel tank quantity indication system on this aircraft type be improved in order to provide the pilot with a proper visual indication of the quantity in both tanks at all times, irrespective of the fuel quantity remaining within the tanks. The investigation found the fuel tank quantity indicators on this aircraft to be of a poor design which could easily result in an inaccurate fuel indication reading by the pilot, especially when the fuel level is getting low (less than ¼ tank). This shortcoming could jeopardise the safe operation of the aircraft, as knowledge of the correct fuel level is critical to a safe flight. It was further noted that the fuel system did not contain any low fuel warning

(i.e., low fuel warning light) that could warn the pilot timeously.

The investigator has inspected a number of these aircraft and found that some of them have a fuel tank light that can be switched on briefly by the pilot to allow him/her to make a much more accurate assessment of the fuel quantity remaining in the fuel tank(s). This is an indication that the design used on the accident aircraft was found to be inadequate (latent failure). It should be kept in mind that this is a high-wing aircraft, which poses its own challenges as the pilot needs to look upwards at an angle to the wing tanks via the view panel to make an accurate assessment of the quantity remaining in the tank(s).

5. APPENDICES

5.1 Annexure A (Aircraft specifications, including fuel tank capacity and unusable fuel)

5.2 Annexure B (Operating Procedures - Fuel system - from the Aircraft Flight Manual)

ANNEXURE A

BUSHBABY SPECIFICATIONS

H.P. and RPM	100-5800
Gross weight	500 kgs
Empty weight	298 kgs
Wing span	9.6m
Overall length	5.41 m
Overall width (wings folds)	2.38 m
Propeller diameter	72"
Baggage capacity	15 kgs
Cruising speed mph	90
Stalling speed (T.I.A.S.)	40
Take-off run (minimum)	150 m
Landing roll (minimum)	150 m
Rate of climb-sea level ft./min.	1000
Best rate of climb speed (T.I.A.S)	60
Cruising range (miles)	432
Service ceiling	14200
Absolute ceiling	16400
Fuel consumption Lt./hr - cruising	15
Fuel capacity, liters (5lt. unusable)	72
Fuel octane rating	unleaded/leaded
Tyre pressure	1 bar

ANNEXURE B

CARBURETOR HEAT:

1. HEAT IS OFF WHEN THE KNOB IS IN AND HEAT IS ON WHEN THE KNOB IS OUT. NOTE: THE HEAT IS USED EITHER FULL OR FULL OFF; INTERMEDIATE POSITIONS TO DO NOT PROVE USEFUL.
2. USE CARBURETOR HEAT WHENEVER CARBURETOR ICING CONDITIONS EXIST. A SLIGHT DROP IN RPM AND ENGINE ROUGHNESS GENERALLY DENOTE ICING CONDITIONS.

ENGINE OPERATING PROCEDURES:

1. FOR DETAILED INSTRUCTIONS ON THE ENGINE OPERATING PROCEDURES AND SERVICE INTERVALS REFER TO THE ROTAX OPERATIONS MANUAL FOR ROTAX 912 ULS PART NO 899370.

FUEL SYSTEM:

1. THE TWO FUEL TANKS (LOCATED IN EACH WING) ARE INDEPENDENTLY CONTROLLED BY A FUEL VALVE FOR EACH TANK. BOTH VALVES CAN BE OPEN, HOWEVER, THE LEFT TANK WILL ALWAYS FEED FIRST. BOTH TANKS DO NOT FEED SIMULTANEOUSLY.