

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8055	
Aircraft Registration	ZU-DVX	Date of Accident	6 January 2006		Time of Accident	1000Z
Type of Aircraft	Ekolot JK-05 Junior		Type of Operation	Private		
Pilot-in-command Licence Type		Microlight	Age	45	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	126.6		Hours on Type	126.6
Last Point of Departure		Saldanna-Vredenburg Aerodrome (FASD), Western Cape Province				
Next Point of Intended Landing		Saldanna-Vredenburg Aerodrome (FASD), Western Cape Province				
Location of the Accident Site with Reference to Easily Defined Geographical Points (GPS readings if possible)						
Saldanna-Vredenburg Aerodrome (GPS position: S32°57' 59" E017°8' 0"), elevation 50 ft above mean sea level (AMSL)						
Meteorological Information		According to the official weather report, fine weather conditions prevailed at the time and place of the accident.				
Number of People on Board	1 + 1	No. of People Injured	0	No. of People Killed	2	
Synopsis						
<p>On 6 January 2006 at approximately 1000Z, the pilot, accompanied by a passenger, took off on a local pleasure flight during daylight conditions.</p> <p>According to witnesses, the take-off run was longer than usual. After becoming airborne, the aircraft drifted to the left and nose-dived into the ground to the left of the runway.</p> <p>The aircraft was destroyed and the occupants sustained fatal injuries during the accident sequence.</p>						
Probable Cause						
The aircraft failed to gain height because the engine failed to produce full power during take-off due to fuel contamination.						
Contributory Factor(s)						
The maximum allowable take-off weight of aircraft was exceeded.						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Paul GG
Manufacturer : PPHU EKOLOT
Model : JK-05-Junior
Nationality : South African
Registration Marks : ZU-DVX
Place : Saldanna–Vredenburg Aerodrome
Date : 6 January 2006
Time : 1000Z

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 two hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997), this report was compiled in the interests 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 According to a witness, the pilot was running the engine for a considerable time on 6 January 2006 before attempting to take off. After some time, he entered the runway and started the take-off run. However, he aborted the take-off, went back to the apron and apparently carried out further engine runs before finally attempting to take off.
- 1.1.2 At approximately 1000Z, the pilot, accompanied by a passenger, finally attempted to take off from runway 02 for a local pleasure flight during daylight conditions.
- 1.1.3 According to witnesses, the take-off run was longer than usual. After becoming airborne, the aircraft drifted to the left and nose-dived into the ground to the left of the runway, some 30 m from the runway edge.
- 1.1.4 The aircraft was destroyed and the occupants sustained fatal injuries during the accident sequence.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed during the accident sequence.



Figure 1: The main wreckage, showing the broken fuselage

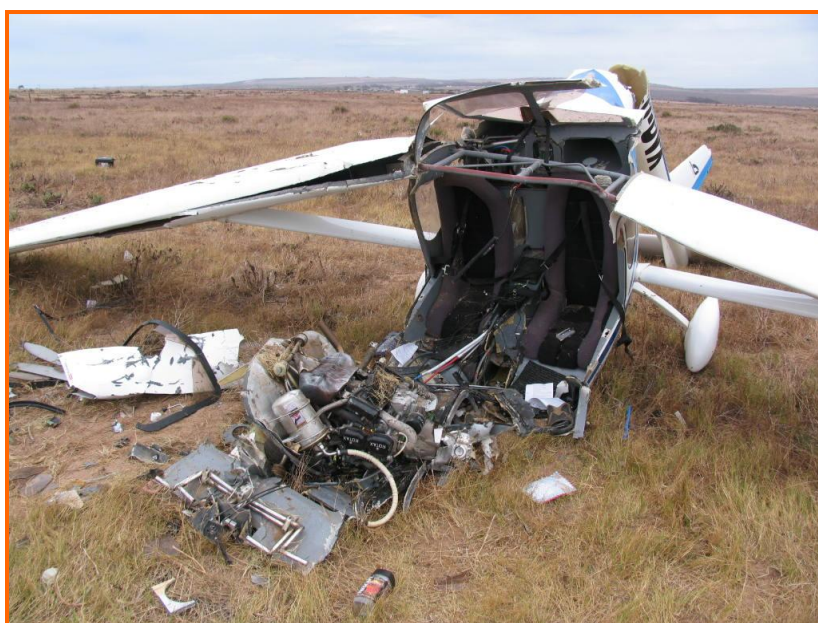


Figure 2: The main wreckage, viewed from the front

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

1.5.1 Pilot-in-Command:

Nationality	South African				
Licence No	*****	Gender	Male	Age	45
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Nil				
Medical Expiry Date	1 February 2007				
Restrictions	Nil				
Previous Accidents	Nil				

1.5.2 Pilot-in-command Flying Experience:

Total Hours	126.6
Total Past 90 Days	14.2
Total on Type Past 90 Days	14.2
Total on Type	126.6

1.6 Aircraft Information

1.6.1 Airframe:

Type	EKOLOT JK-05 JUNIOR
Serial #	05-04-10
Manufacturer	PPHU EKOLOT
Year of Manufacture	2005
Total Airframe Hours at Last Annual Inspection	116.8 on 1 September 2005
Hours Since Last Annual Inspection	9.8
Authority to Fly (Expiry Date)	28 September 2006
C of R (Issue Date)	18 July 2005

1.6.2 Engine:

Type	Rotax 912 UL
Serial #	4406577
Hours Since New	126.6
Hours Since Overhaul	TBO not yet reached

1.6.3 Propeller:

Type	Aerosail
Hours Since New	126.6
Hours Since Overhaul	TBO not yet reached

1.6.4 Weight and Balance:

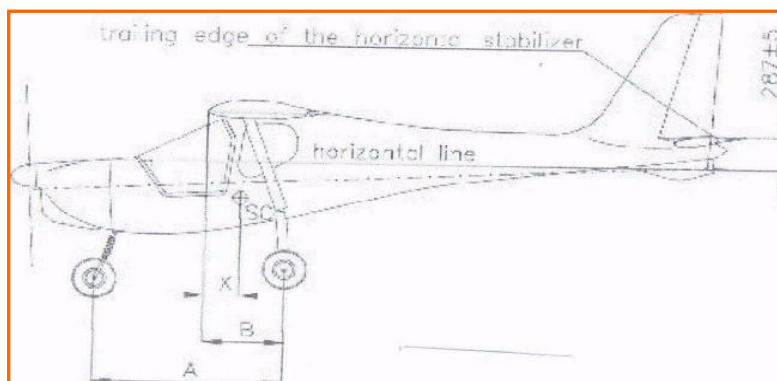


Figure 3: Diagram showing reference points on aircraft for determining mass and balance

1.6.5 Note:

A (mm)	1 515
B (mm)	627
X (mm)	240.4 mm
$X = B - (WN * A) / WT$	
Note	<i>X has to be between 233.4 mm and 304.3 mm</i>

1.6.6 Empty Weight of Aircraft:

Wheel	Weight			
	Marking	Indication (kg)	Tare (kg)	Value (kg)
Nose	WN	76.8	0	76.8
Main Left	WML	112.7	0	112.7
Main Right	WMR	111.5	0	111.5
Weight of plane (WT)				301.0

1.6.7 Mass and Balance:

Item	Weight (kg)
Empty Weight of Aircraft	301
Fuel (60 l) (Density: 1 l = 0.9 kg)	54
Pilot and Passenger (seats are side by side): Pilot = 170 kg and Passenger = 100 kg	270
Aircraft Mass at Time of Take-off	625
MTOW = 472.5 to 550 kg	

From the above calculation it is clear that the aircraft was overweight by a minimum of 75 kg.

1.7 Meteorological Information

1.7.1 No official weather observations were available at the time and place of the accident. The most likely conditions, obtained from the SA Weather Services, at the place of the accident were as follows:

Wind Direction	200° TN	Wind Speed	10 kts	Visibility
Temperature	28°C	Cloud Cover	Nil	Good
Dew Point	15°C			

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment for the aircraft type.

1.9 Communications

1.9.1 The aircraft was equipped with standard communication equipment for the aircraft type.

1.9.2 Saldanna-Vredenburg Aerodrome was unmanned. There was no recorded communication.

1.10 Aerodrome Information

Aerodrome Location	Saldanna-Vredenburg
Aerodrome Co-ordinates	S32°57.5' E017°58.2'
Aerodrome Elevation	50 ft
Runway Designations	02/20
Runway Dimensions	1 300 m x 23 m
Runway Used	02
Runway Surface	Asphalt
Approach Facilities	None

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with a cockpit voice recorder (CVR) or a flight data recorder (FDR), and neither was required by regulations to be fitted to this type of aircraft.

1.12 Wreckage and Impact Information

1.12.1 The aircraft drifted to the left of the runway following lift-off and nose-dived into the ground with a steep nose-down attitude, some 30 m from the runway edge.

1.12.2 During impact with terrain, the fuselage broke in two just behind the cabin area.

1.12.3 The cabin/cockpit area was destroyed during the accident sequence.

1.12.4 The fuel tank ruptured and the content thereof could not be determined also, detailed test could not be undertaken due to insufficient fuel.

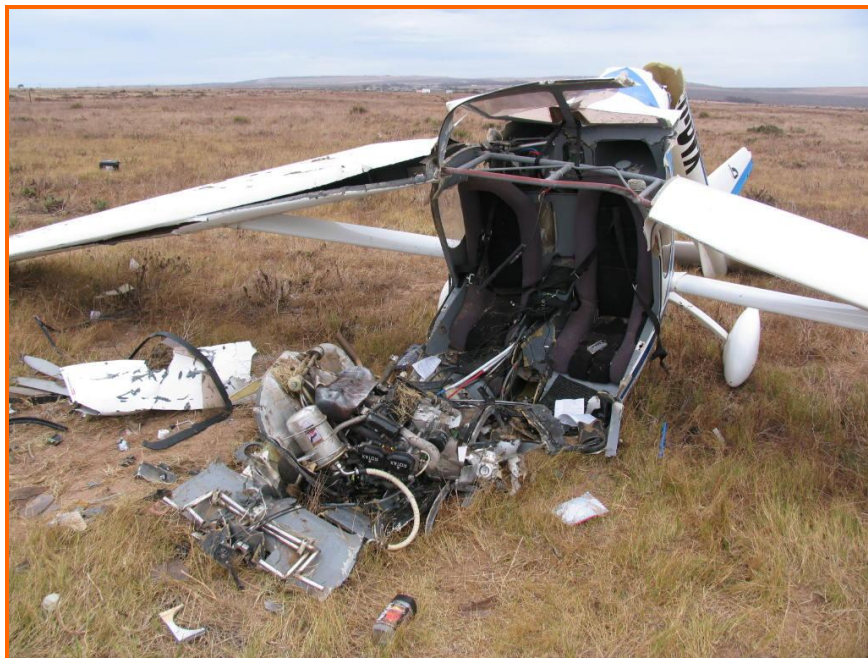


Figure 4: The cabin/cockpit area was destroyed during the accident sequence

1.12.5 The aircraft was equipped with a ballistic parachute but the parachute was not activated, although serviceable.



Figure 5: The ballistic parachute fitted to the aircraft

1.13 Medical and Pathological Information

1.13.1 Pilot:

- 1.13.1.1 According to the medico-legal post-mortem examination, the cause of death of the pilot was consistent with widespread deceleration injuries in a morbidly obese adult male.
- 1.13.1.2 According to the Forensic Chemistry Laboratory report, the blood alcohol level of the pilot was 0.02 g / 100 ml.
- 1.13.1.3 According to the medico-legal post-mortem examination, the pilot weighed 170 kg and was 1.85 m in height.
- 1.13.1.4 The carbon monoxide level was 27% saturation of the total haemoglobin.
- 1.13.1.5 Two ECG (Electro Cardio Graph) stickers were found on the body, but this was due to medical intervention on the accident site.

1.13.2 Passenger:

- 1.13.2.1 According to the medico-legal post-mortem examination, the cause of death of the passenger was consistent with multiple injuries.
- 1.13.2.2 According to the Forensic Chemistry Laboratory report, the blood alcohol level of the passenger was 0.01 g / 100 ml.
- 1.13.2.3 According to the medico-legal post-mortem examination, the passenger weighed 100 kg and she was 1.72 m in height.

1.13.2.4 The carbon monoxide level was 12% saturation of the total haemoglobin.

1.13.2.5 Two ECG (Electro Cardio Graph) stickers were found on the body, but this was due to medical intervention on the accident site.

1.14 Fire

1.14.1 There was no fire.

1.15 Survival Aspects

1.15.1 The severity of the impact, as illustrated by the severe break-up of the cockpit area, rendered this accident to be unsurvivable.

1.16 Tests and Research

1.16.1 Due to extensive impact damage, it was not possible to perform a bench test on the engine. A partial teardown inspection of the engine revealed no mechanical reasons that could have caused the engine to fail during the take-off.



Figure 6: The engine directly ahead of the main wreckage

1.16.2 Examination of the fuel system revealed severe contamination in the carburettor fuel bowls and inside the fuel tank.



Figure 7: Contamination in the carburettor fuel bowl



Figure 8: The carburettor fuel bowls, showing severe contamination



Figure 9: The fuel tank, showing contamination inside.

1.16.3 According to a witness, the pilot was running the engine for a considerable time before attempting to take off. After some time, he entered the runway and started the take-off run. However, he aborted the take-off, went back to the apron and apparently carried out further engine runs before finally attempting to take off.

1.17 Organisational and Management Information

1.17.1 Not applicable as this was a private flight.

1.18 Additional Information

1.18.1 According to the regulations, alcohol in any specimen of blood taken from any part of a pilot's body should not exceed 0.02 g per 100 ml. It can thus be seen that the pilot was within the limitations of the regulations. See CARS 91.02.3 (2) (b).

1.19 Useful or Effective Investigation Techniques

1.19.1 None considered necessary.

2. ANALYSIS

2.1 According to available information, the pilot was the holder of a valid microlight pilot licence, was rated on the aircraft type and held a valid, unrestricted medical certificate. The weight of the pilot was 170 kg. The blood alcohol level of the pilot was recorded as 0.02 g / 100 ml. The aircraft was equipped with a ballistic parachute but the parachute was not activated, although serviceable. All of the above raised concerns as to the ability of the pilot to properly operate the throttle and the control stick of the aircraft and also his ability to activate the ballistic parachute during the accident sequence.

2.2 According to weight and balance calculations, the CG of the aircraft was within the prescribed limits of the manufacturer but was overloaded by at least 75 kg. The leading edge of the wing is used as a datum point when calculating the CG position of the aircraft. Both the fuel tanks, as well as the seats are situated just slightly behind the datum point. From the above, it is noted that it is not possible to exceed the limitations of the CG if the aircraft is loaded within the weight capacity of the aircraft.

2.3 Examination of the engine revealed no mechanical reasons that could have caused the engine to fail. However, examination of the fuel system revealed severe contamination in the carburettor fuel bowls and the inside of the fuel tank. A witness reported that the pilot was running the engine for a considerable time before attempting to take off. After some time, he entered the runway and started the take-off run. However, he aborted the take-off, went back to the apron and apparently carried out further engine ground runs before finally attempting to take off again. The witness reported that the

aircraft stayed unusually long on the ground during the take-off run. When it finally took off, the aircraft drifted to the left of the runway and then nose-dived into the ground. From the above, it would appear that the engine failed to produce full power during the take-off and thus the aircraft failed to gain height. This was probably exacerbated due to the overload condition

- 2.4 It was not possible for the investigating team to determine the control freedom of movement once the pilot was seated in the cockpit behind the controls. It is believed that his physical condition could have resulted in limited control stick movement, especially when back pressure on the stick was required.

3. CONCLUSION

3.1 Findings

- 3.1.1 On 6 January 2006 at approximately 1000Z, the pilot, accompanied by a passenger, took off for a local pleasure flight during daylight conditions.
- 3.1.2 According to witnesses, the aircraft ran on the runway for longer than usual. After becoming airborne, the aircraft nose-dived into the ground to the left of the runway. Although the aircraft was equipped with a serviceable ballistic parachute, it was not activated.
- 3.1.3 The aircraft was destroyed and the occupants sustained fatal injuries during the accident sequence.
- 3.1.4 The pilot was the holder of a valid microlight pilot licence, was rated on the aircraft type and held a valid, unrestricted medical certificate.
- 3.1.5 According to available information the aircraft was correctly maintained.
- 3.1.6 The CG was within the prescribed limits by the manufacturer, but the aircraft was overloaded by 75 kg.
- 3.1.7 The aircraft was equipped with standard navigation and communication equipment for the aircraft type.
- 3.1.8 According to the post-mortem report, the blood alcohol level of the pilot was recorded as 0.02 g / 100 ml.
- 3.1.9 The aircraft examination revealed that the fuel system of the aircraft was severely contaminated.

3.2 Probable Cause/s

3.2.1 The aircraft failed to gain height because the engine failed to produce full power during take-off due to fuel contamination.

3.3 Contributory Factor(s)

3.3.1 The maximum allowable take-off weight of aircraft was exceeded.

4. SAFETY RECOMMENDATIONS

4.1 The SACAA should set up criteria regarding restrictions on the issue of pilot licences with reference to the physical capabilities of pilots to control the aircraft type.

5. APPENDICES

5.1 None.

Report reviewed and amended by the Advisory Safety Panel on 20 April 2010
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