



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8021	
Aircraft Registration	ZS-KUB	Date of Accident	09 October 2005		Time of Accident	0945Z
Type of Aircraft	Maule M-5-210T (Aeroplane)		Type of Operation		Private	
Pilot-in-command Licence Type		Private	Age	50	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	415		Hours on Type	62
Last point of departure		Krugersdorp Aerodrome (FAKR)				
Next point of intended landing		Krugersdorp Aerodrome (FAKR)				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Approximately 1km North of Krugersdorp Aerodrome: GPS S26°04.51' E027°43.31'						
Meteorological Information		Surface wind, 320°/10kt, Temperature, 27°C, Clouds Nil.				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>The pilot embarked on a pleasure flight from Krugersdorp Aerodrome (FAKR). According to the pilot, immediately after take-off the engine started to run very rough and he immediately cycled the throttle and mixture controls and set fuel selector to both tanks. The engine continued to run very rough and was not producing sufficient power to be able to maintain altitude. Due to the mountainous terrain, the pilot initiated a turn to the right towards a turf farm in the valley approximately 1km north of FAKR. The aircraft started to descent rapidly. The pilot broadcasted a Mayday call on VHF frequency on 122.00 MHz and initiated a forced landing on a farm.</p> <p>Upon landing the pilot noticed obstacles, including a pivot irrigation system and other irrigation equipment. On touch down the aircraft bounced a few feet into the air. The right wing struck a steel stay cable on the irrigation system, shearing off the outer 1.5m of the wing. The aircraft yawed and rolled violently to the right and impacted the ground heavily, which caused the right main landing gear and tail wheel assembly to collapse. This resulted in a propeller striking the ground. The pilot and the passenger were not injured in the accident. The pilot was the holder of a valid private pilot's licence and had the aircraft type endorsed in his logbook. The last annual inspection that was carried out on the aircraft prior to the accident was certified on 10 June 2005 at 1413.4 airframe hours.</p>						
Probable Cause						
Incorrect fuel mixer settings.						

IARC Date		Release Date	
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AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : C.J.A Martins
 Manufacturer : Maule Aircraft Corporation
 Model : Maule M-5-210T
 Nationality : South African
 Registration Marks : ZS-KUB
 Place : Krugersdorp Area
 Date : 09 October 2005
 Time : 0945Z

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 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 given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 According to available information, the pilot was on a pleasure flight in the area. The flight routed via the Hartebeespoort, Magaliesburg areas and the flight duration was approximately 1.5 hour. The pilot landed the aircraft at FAKR to uplift fuel. The aircraft uplifted 106 litres of Avgas.
- 1.1.2 After having refuelled, the pilot and his passenger took off from runway 26. The engine ran normally during take-off and the initial climb. At a height of approximately 100 to 150 feet above the runway, the engine backfired and started to run very rough. The pilot then cycled the throttle and mixture controls and set the fuel selector lever to both tanks.
- 1.1.3 The engine continued to run rough and was not producing sufficient power and the aircraft could not maintain altitude. Due to the mountainous terrain at the threshold of runway 26, the pilot immediately turned to the right towards a farm North of FAKR.
- 1.1.4 The pilot then elected to execute a forced landing on a farm and broadcasted a Mayday call on VHF frequency 122.00MHz.

1.1.5 On landing, the right wing collided with one of the steel cables and poles holding the sprinkler system, resulting in failure of the outer wing. The aircraft yawed and rolled violently, resulting in a hard and heavy landing. The right landing gear failed following the hard and heavy landing, and the propeller subsequently struck the ground.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained damage to the right wing, right landing gear, nose section and propeller.



Photo 1

1.4 Other Damage

1.4.1 The irrigation system on the ground.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	50
Licence number	*****	Licence type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	31 December 2008				
Restrictions	Corrective Lenses				
Previous Accidents	None				

Flying Experience:

Total Hours	415
Total Past 90 Days	20
Total on Type Past 90 Days	15
Total on Type	62

1.6 Aircraft Information

Airframe

Type	Maule M-5-210T	
Serial Number	9008C	
Manufacturer	Maule Aircraft Corporation	
Year of Manufacture	1980	
Total Airframe Hours (At time of Accident)	1425.7	
Last MPI (Hours & Date)	1413.4	10 June 2005
Hours since Last MPI	14.2	
C of A (Issue Date)	20 December 1999	
C of R (Issue Date) (Present owner)	30 July 1999	
Operating Categories	Standard	

Engine

Type	Lycoming / TO-F1A6D
Serial Number	L322-69A
Hours since New	1413.4
Hours since Overhaul	T.B.O. not yet reached

Propeller

Type	Hartzell / HC-C2YK-1BF
Serial Number	DK1071
Hours since New	1114.8
Hours since Overhaul	22.2

1.7 Meteorological Information

1.7.1 Weather information as obtained from the South African Weather Services for the FAKR area:

Wind direction	320°	Wind speed	10knts	Visibility	CAVOK
Temperature	27°C	Cloud cover	0/8	Cloud base	Nil
Dew point	10°C				

1.8 Aids to Navigation

1.8.1 The aircraft was fitted with standard navigation equipment for the aircraft type as approved at the time of certification. There was no evidence of, or reported malfunction of the navigational aids prior or during flight.

1.9 Communications

1.8.1 There was no reported malfunction with the communication equipment prior or during the flight.

1.8.2 The pilot broadcasted a Mayday call on the VHF frequency 122.00 MHz and executed a forced landing on a farm approximately 1km from the aerodrome.

1.10 Aerodrome Information

1.10.1 The accident occurred on a farm approximately 1km North of FAKR.

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 approached the landing area at a fairly high speed and yawed violently to both the left and right before landing hard on the right-hand gear. This resulted in the failure of the right main gear and wing, impacting with the ground, resulting in the failure of the right out board wing. It continued for approximately 15 metres before impact with the sprinkler systems cable and pole, where it came to rest. See Photo 2 below.



Photo 2

1.13 Medical and Pathological Information:

1.13.1 The pilot sustained no injuries.

1.14 Fire:

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects:

1.15.1 The accident was considered survivable, as the cockpit area remained intact and undamaged during the accident sequence. Also the aircraft was fitted with a safety harness which the pilot used and which did not fail.

1.16 Tests and Research:

1.16.1 On visual inspection by the investigators after the accident, fuel was present in the tanks and there was no evidence of contamination.

1.16.2 The investigators requested the assistance of the Aircraft Maintenance Organisation (AMO 291). The AMO determined that, though the propeller blades were damaged, the engine was not damaged and a decision was taken to start the engine whilst still attached to the airframe. The engine was started and it started and ran without any difficulty and it ran normally though it was not taken to full power. No sign of abnormalities or malfunctioning were found or observed.

1.16.3 Conditions that will lead to engine failure or power loss:

i) Fuel quantity.

An investigation was done by simply physically checking inside the aircraft fuel tanks, the fuel filter, and the fuel gauges and there was evidence of sufficient fuel.

ii) Fuel type.

The investigator on site clearly established that the correct type of fuel was being used, which was Avgas for this aircraft engine type (reciprocating engine) and it was free from contaminants.

iii) Ignition.

During the engine run, the engine started without any problem, therefore there was no evidence of abnormalities. The piston engine has a dual ignition system which works independently of the aircraft's electrical system and has two spark plugs per cylinder, therefore total loss of ignition is fairly rare.

iv) Fuel air mixture and component.

During the engine run, there were no signs of abnormalities or malfunctioning. Though the engine was not at full power due to damaged propeller blades, it ran normally and there was no evidence of any component failure during the process. During the investigation after the accident the pilot mentioned that at approximately 100 to 150 feet above the runway, the engine backfired and ran very roughly and he therefore cycled the throttle and mixture controls and set the fuel selector lever to both tanks.

1.17 Organisational and Management Information:

1.17.1 This was a private flight.

1.17.2 The last annual inspection that was carried out on the aircraft prior to the accident was certified on 10 June 2005 by AMO (Aircraft Maintenance Organisation) No 291. The person that certified the task held a valid AME (Aircraft Maintenance Engineer) licence.

1.17 Additional Information

1.17.1 None.

1.19 Useful or Effective Investigation Techniques

1.18.1 None.

2. ANALYSIS

- 2.1 The pilot, being the owner of the aircraft, departed Krugersdorp aerodrome on a pleasure flight with the intention to land back at the same aerodrome. The pilot mentioned that the aircraft engine lost power after take-off and during the initial climb and that he was unable to maintain altitude.
- 2.2 The pilot executed a forced landing on the farm 1km North of FAKR. On landing at the farm, due to very bad terrain and obstacles on the ground such as irrigation system equipment which was hit, the aircraft yawed and rolled violently to the right and impacted the ground heavily, which caused the right main landing gear and tail wheel to collapse. This resulted in the propeller striking the ground.
- 2.3 After the accident, the investigator on site went through some checks before engine run and after. He noted that the aircraft had enough fuel on board and that it was the right type of fuel and free from contaminants. An engine ground run was also carried out and the engine started smoothly with no evidence of malfunctioning and abnormalities. There was evidence of good ignition and positive fuel consumption from engine start to shutdown in the cockpit. There was also no evidence of any component failure.
- 2.4 The pilot managed to land the aircraft on the farm, even though the aircraft wing and undercarriage were damaged by an irrigation system. Fine weather conditions prevailed at the time and were therefore not considered to have any bearing on the accident.
- 2.5 The maintenance records of the aircraft were checked and it was noted that the aircraft had been subjected to an annual inspection on 10 June 2005. The inspection was performed by an approved AMO (Aircraft maintenance organisation). The aircraft had flown a total of 14.2 hours since the last annual inspection was certified.
- 2.6 It is the opinion of the investigator that the pilot may have incorrectly adjusted the fuel mixture prior to take-off. This then resulted in the engine backfiring during take-off and subsequent engine failure.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot had a valid private pilot's licence and had the aircraft type endorsed in his logbook.
- 3.1.2 The authority to fly the aircraft was not valid.
- 3.1.3 The aircraft was maintained in accordance with the approved maintenance schedule with the last annual inspection being certified on 10 June 2005.
- 3.1.4 The person who certified the last annual inspection of the aircraft was accredited by the CAA.
- 3.1.5 The pilot was engaged on a pleasure flight.

- 3.1.6 The aircraft had been refuelled with 106.06 litres of Avgas before the accident occurred.
- 3.1.8 Shortly after landing, the right wing impacted with a sprinkler system and the aircraft yawed and rolled violently to the right. The right-hand side main landing gear assembly and tail wheel broke off, and the propeller impacted with the ground.
- 3.1.9 The engine may have suffered a power loss as the result of an incorrect air fuel mixture setting.
- 3.1.9 Fine weather conditions prevailed at the time and were not considered to have any bearing on the accident.

3.2 Probable Cause/s

- 3.2.1 Incorrect fuel mixer settings.

4. SAFETY RECOMMENDATIONS

- 4.1 None.

5. APPENDICES

- 5.1 There are no appendices to this report.

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Report reviewed and amended by the Advisory Safety Panel
24 February 2009