AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

		Reference:		**CA18/2/3/9941**	
Aircraft Registration	**ZU-IJZ**	**Date of Accident**	11 January 2021	**Time of Accident**	0920Z
Type of Aircraft	Safari LSA		**Type of Operation**	Private (Part 94)	
Pilot-in-command Licence Type	National Pilot Licence		**Age** 67	**Licence Valid**	Yes
Pilot-in-command Flying Experience	**Total Flying Hours**		65.6	**Hours on Type**	65.6

Last Point of Departure	Kroon Airfield, Gauteng province
Next Point of Intended Landing	Kroon Airfield, Gauteng province
Damage to Aircraft	Substantial

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

8.8nm north-east of Hartbeespoort Dam at Global Positioning System (GPS) co-ordinates: S25° 39' 31.50" E28° 0' 24.09" at an elevation of 4341 feet

Meteorological Information	Wind direction: 030º; Wind speed: 03kts; Temperature: 23ºC; Dew Point: 16ºC; Cloud cover: few; Cloud base 2000ft; QNH: 1019hPA						
Number of People On-board	1	**Number of People Injured**	0	**Number of People Killed**	0	**Other (On Ground)**	0

Synopsis

On 11 January 2021, a pilot on-board a Safari LSA aircraft with registration mark ZU-IJZ took off on a private flight from Kroon Airfield in Gauteng province to Bundu Airfield to conduct touch-and-go landing exercises and, thereafter, return to Kroon Airfield. During take-off from Kroon Airfield, the pilot stated that he rotated at 60 miles per hour (mph) and then climbed at 65mph. But, as he reached the threshold at approximately 50 feet above ground level (AGL), the engine started to lose power. The temperature and pressure readings were in the "green", but the pilot noticed that the boost pressure was dropping. He then levelled off the aircraft to maintain airspeed, however, the speed continued to drop to below 60mph. The pilot then applied half flaps to avoid stalling, but the speed continued to decrease, and he was unable to recover the aircraft from that condition. He then opted to execute a precautionary landing on a gravel road ahead of his flight path. However, just before touch down, the aircraft stalled; and, as the aircraft touched down, the left main landing gear wheel assembly ran over a sand ridge, causing the aircraft to veer off to the left of the gravel road where the aircraft came to a halt up on the embankment. The aircraft sustained substantial damage, while the pilot reported minor injuries.

Probable Cause/s and/or Contributory Factors

It is likely that during take-off, the fuel pressure regulator failed, resulting in a drop of fuel pressure to below 0.25 bar and, thus, the engine was unable to provide sufficient power to sustain flight. The cause of the fuel pressure regulator failure could not be established as the tests did not reveal any abnormalities.

SRP Date	8 June 2021	Publication Date	9 June 2021

INTRODUCTION

Reference Number	**:** CA18/2/3/9941
Name of Owner/Operator	**:** Pieter Furter
Manufacturer	**:** Kit Planes for Africa
Model	**:** Safari LSA
Nationality	**:** South African
Registration Marks	**:** ZU-IJZ
Place	**:** Kroon Airfield, Gauteng Province
Date	**:** 11 January 2021
Time	**:** 0920Z

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****.*

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.

Investigation Process:

The accident was notified to the Accident and Incident Investigations Division (AIID) on 11 January 2021 at about 0940Z. The investigator/s went to Petit Airfield (where the aircraft was recovered to) on 19 January 2021 to conduct a follow-up investigation. The investigator/s co-ordinated with all authorities on site by initiating the accident investigation process according to CAR Part 12 and investigation procedures. The AIID is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:
1. Whenever the following words are mentioned in this report, they shall mean the following:

- *Accident — this investigated accident*
- *Aircraft — the Safari LSA involved in this accident*
- *Investigation — the investigation into the circumstances of this accident*
- *Pilot — the pilot involved in this accident*
- *Report — this accident report*

2. Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

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ABBREVIATION	DESCRIPTION
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AP	Approved Person
CAR	Civil Aviation Regulations
CVR	Cockpit Voice Recorder
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CRS	Certificate of Release to Service
ECU	Electronic Control Unit
FDR	Flight Data Recorder
FT	Feet
GPS	Global Positioning System
kt	Knot
Km	Kilometre
m	Metre
Mph	Miles Per Hour
MPI	Mandatory Periodic Inspection
nm	Nautical Mile
QNH	Query Nautical Height
RWY	Runway
SACAA	South African Civil Aviation Authority
TBO	Time Between Overhaul
UTC	Co-ordinated Universal Time
VFR	Visual Flight Rules
Z	Zulu

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1. On Monday 11 January 2021, a pilot on-board a Safari LSA aircraft with registration mark ZU-IJZ took off from Runway (RWY) 11 at Kroon Airfield in Gauteng province. The intention was to fly to Bundu Airfield, located 3 kilometres (km) east of Kroon Airfield to practise touch-and-go landing exercises before returning to Kroon Airfield. The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. The pilot stated that he started up the engine and proceeded to the departure runway threshold where he conducted the pre-take-off checks. Once satisfied, he proceeded with take-off from RWY 11. The pilot further stated that he rotated at 60 miles per hour (mph) and climbed at 65mph, but as he reached the threshold at approximately 50 feet (ft) above ground level (AGL), the engine started to lose power. The temperature and pressure readings were in the “green”, but he noticed that the boost pressure was dropping. The pilot was then forced to level off the aircraft to maintain the aircraft’s airspeed, however, the speed continued to drop to below 60mph. He then applied half flaps to avoid stalling, but the speed continued to decrease, and he was unable to recover the aircraft from that condition and had to execute a precautionary landing. The pilot further stated that the aircraft did not misfire or run rough, nor was there a loud bang or any warning lights prior to losing power.

1.1.3. The pilot reported that he carried out the emergency procedures recommended at the airfield in the event of an emergency after take-off. He elected to land on the gravel road, which was still under construction. However, just before touch down, the aircraft stalled, and the left wing dropped, putting the aircraft in an awkward position for proper landing. The left main landing gear wheel assembly ran over the sand ridge created by the road grader and the aircraft veered off to the left and came to a halt on the embankment on the side of the highway (gravel road). The aircraft sustained damage to the right main landing gear, tail landing gear, right-side wing, rear fuselage and tail section. The pilot reported minor injuries after the accident.

1.1.4. The accident occurred during daylight at the following Global Positioning System (GPS) co-ordinates: S25° 39’ 31.50” and E28° 01’ 00” at an elevation of 4341ft.

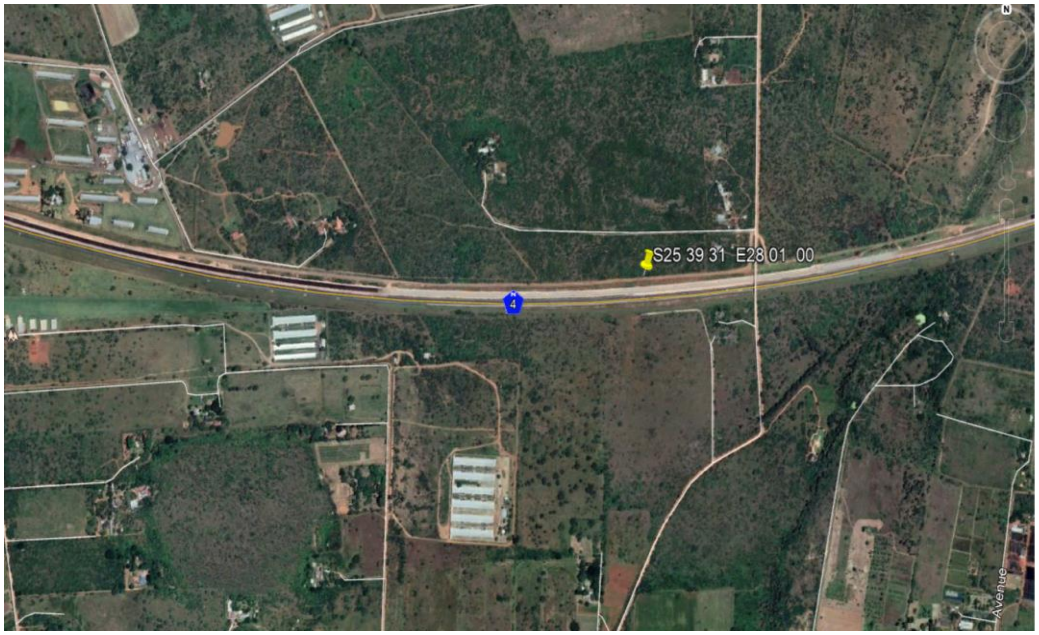

Figure 1: An aerial view of the accident site. (Source: Google Maps)

1.2. Injuries to Persons

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

Note: Other means people on ground.

1.3. Damage to Aircraft

1.3.1. The aircraft sustained substantial damage during the accident sequence.

Figure 2: The aircraft post-accident. (Source: Pilot)

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	67
Licence Number	0279044247	Licence Type	NPL		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	18 February 2021				
Restrictions	None				
Previous Accidents	None				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant to this accident.

Flying Experience:

Total Hours	65.6
Total Past 24 Hours	0.3
Total Past 7 Days	1.7
Total Past 90 Days	10.7
Total on Type Past 90 Days	10.7
Total on Type	65.6

1.5.1 The pilot was issued a National Pilot Licence on 5 September 2020 with an expiry date of 4 September 2022. The pilot's Class 4 aviation medical certificate was issued on 18 February 2019 with an expiry date of 18 February 2021, and with no restrictions.

1.5.2 The approved person (AP) who performed the last mandatory maintenance inspection (MPI) on the aircraft prior to the accident flight was in possession of an Approved Person Certificate No:404. The AP was issued an Approved Person Certificate on 17 February 2020 with an expiry date of 5 February 2022. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on this aircraft type.

1.6. Aircraft Information

Airframe:

Manufacturer/Model	Kit Planes for Africa	
Serial Number	027-03-16 SAF	
Year of Manufacture	2019	
Total Airframe Hours (At Time of Accident)	170.58	
Last Annual Inspection (Date & Hours)	22 August 2020	159.91
Hours Since Last Annual Inspection	10.67	
Authority to Fly (Issue Date)	5 October 2020	
Authority to Fly Expiry Date	31 October 2021	
C of R (Issue Date) (Present Owner)	24 July 2019	
Operating Categories	Part 94	
Type of Fuel Used	Unleaded 95	
Previous Accidents	None	

Note: Previous accidents refer to past accidents the aircraft was involved in, when relevant to this accident.

1.6.1 The last annual maintenance inspection prior to the accident flight was carried out on 22 August 2020 at 159.91 airframe hours. The aircraft was issued a Certificate of Release to Service (CRS) on 22 August 2020 with an expiry date of 21 August 2021 or at 209.91 hours, whichever occurs first.

1.6.2 In December 2020, the aircraft was sent in for a turbo boost defect, which was rectified. During the rectification of that defect, no moving parts were replaced, only the wastegate lever was adjusted. The aircraft was test flown, and the defect signed out on 5 December 2020. According to the flight folio page serial number 0003, the aircraft was flown by the owner on 8 January 2021 for 1.4 hours, and no further defects were reported.

1.6.3 The pilot had followed the emergency procedures as detailed in his Pilot Operating Handbook (POH) when he levelled off the aircraft to maintain the aircraft's airspeed (see Figure 11).

Engine:

Manufacturer/Model	Rotax
Serial Number	4420150
Part Number	914 UL
Hours Since New	847
Hours Since Overhaul	TBO not reached

Propeller:

Manufacturer/Model	IVO
Serial Number	DR3/72/35740/2
Hours Since New	166.33
Hours Since Overhaul	TBO not reached

1.6.4 According to the Rotax engine maintenance manual, the recommended engine time before overhaul (TBO) is 2000 hours. The turbo does not have a specific inspection on the 100 hour/annual inspection; however, the wastegate flap check is required to be carried out on the 100 hour/annual inspection which is part of the turbo system.

1.6.5 The maintenance manual also does not call for the fuel regulator to be inspected during the 100 hour/annual inspection.

1.6.6 The aircraft is fitted with a turbo control unit that electronically controls the boost pressure by controlling the wastegate flap in the exhaust gas turbine. The wastegate regulates the speed of the turbo charger and, consequently, the boost pressure in the airbox.

1.7. Meteorological Information

1.7.1 The weather information below was obtained from the South African Weather Service (SAWS) for Kroon Airfield (Gauteng) on 11 January 2021 at 0920Z.

Wind Direction	030	Wind Speed	3kts	Visibility	9999m
Temperature	23ºC	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	16ºC	QNH	1019hPa		

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA). There were no recorded defects with the navigational equipment prior to the flight.

1.9. Communication

1.9.1 The aircraft was equipped with standard communication equipment as approved by the Regulator (SACAA). There were no recorded defects with the communication equipment prior to the flight.

1.10. Aerodrome Information

Aerodrome Location	Kroon Airfield Gauteng
Aerodrome Status	Licensed
Aerodrome Co-ordinates	S25°39'34" E028°00'06"
Aerodrome Altitude	4300 feet
Runway Headings	29/11
Runway Dimensions	790 X 20 m
Runway Used	11
Runway Surface	Grass
Approach Facilities	None
Radio Frequency	124.800

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 by regulation to be fitted to this aircraft type.

1.12 Wreckage and Impact Information

1.12.1 The pilot reported that he experienced engine power loss during take-off and was forced to level off the aircraft to maintain airspeed. He then executed a precautionary landing on a gravel road ahead of his flight path, however, just before touch down, the aircraft stalled and the left wing dropped. The left main landing gear wheel assembly ran over the sand ridge created by the road grader and the aircraft veered off to the left of the gravel highway, coming to a stop up on an embankment.

1.12.2 The right main landing gear strut was damaged, as well as the propeller blades which struck the ground (during the accident) and the tail section, including the tail wheel.

Figure 4: Damage to the tail section.

Figure 5: Damage to the right main landing gear.

1.13 Medical and Pathological Information

1.13.1 None.

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 due to the cabin and cockpit area not being damaged. The aircraft damage was limited to the tail section, the wings and the undercarriage.

1.16 Tests and Research

1.16.1 When the accident-damaged aircraft arrived at the manufacturer's facility, it was inspected and fuel samples were taken, which were found to be of the correct grade and clear of any sediments or contaminants. The boost system wastegate waste cycle operation was tested, and the wastegate flap cycled correctly.

1.17 Organisational and Management Information

1.17.1 The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.17.2 The aircraft was maintained by Kit Planes for Africa in accordance with Part 148 of the Civil Aviation Regulations (CAR) 2011 as amended, as well as aircraft maintenance manuals.

1.17.3 The AP who performed the last MPI on the aircraft prior to the accident flight was in possession of an Approved Person Certificate (404). The AP was issued an Approved Person Certificate on 17 February 2020 with an expiry date of 5 February 2022. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on this aircraft type.

1.18 Additional Information

1.18.1 **Turbo boost** (Rotax 914 Maintenance manual)

The Rotax 914 engine is equipped with an exhaust gas turbo charger, making use of the energy in the exhaust gas for precompression of the intake air (Boost pressure). The boost pressure in the airbox is controlled by means of an electronically controlled flap (wastegate) in the exhaust gas turbine. The wastegate regulates the speed of the turbo charger and consequently the boost pressure in the airbox. Besides the throttle position, over speeding of the engine and too high intake air temperature have an effect on the nominal boost pressure. If one of the stated factors exceeds the specified limits, the boost pressure is automatically reduced, thus protecting the engine against overload.

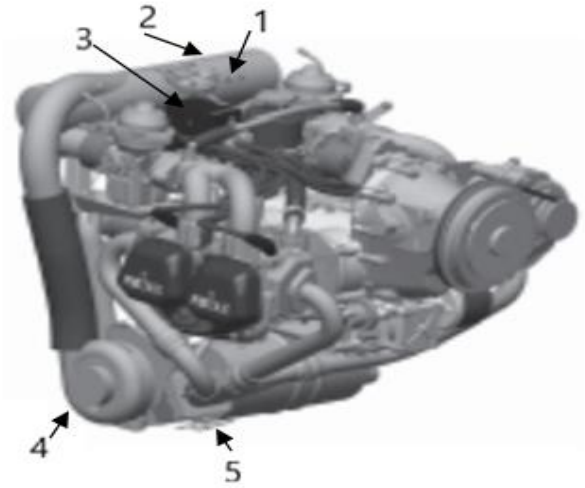

Figure 6: Rotax 914 engine. (Source: Rotax Maintenance Manual)

1	Airbox air sensor
2	Airbox
3	Turbo control unit
4	Turbo
5	Wastegate

Wastegate

A wastegate is a valve that controls the flow of exhaust gases to the turbine wheel in a turbo charged engine. Diversion of exhaust gases regulates the turbine speed, which in turn, regulates the rotating speed of the compressor. The primary function of the wastegate is to regulate the maximum boost pressure in the system to protect the engine and the turbocharger. Generally, the wastegate does not give problems.

There are three instances which could cause the engine to lose power that the manufacturer brought to the investigator's attention. The first possibility is when the wastegate controller stops operating after take-off and would stay open.

The Rotax manual states that when the boost pressure drops and there is a reduction in speed, the pilot should hear a loud noise or bang that would accompany this drop in pressure and speed. It further states that the possible cause would be a turbo fracture or a wastegate remaining open (see Figure 10).

The second possibility is from the manual which states that there should be an orange caution light that would illuminate which would be an indication of the failure of the sensor on the airbox (see Figure 10).

The third possibility, which is more likely, is that the fuel pressure regulator had failed, resulting in less fuel in the engine.

Figure 7: Green arrow shows airbox pressure sensor.

Fuel Pressure regulator

The fuel pressure regulator (1) is mounted on the airbox. The fuel pressure control is essential for flawless engine operation because it keeps the fuel pressure permanently at approximately 0.25 bar above the varying boost pressure in the airbox. The diaphragm (2) divides the pressure regulator into the top fuel chamber (3) and the air chamber (4). The force of the pressure spring, which is set by the adjusting screw (5) establishes an equilibrium of forces on the diaphragm at a fuel pressure of 0.25 bar above the actual airbox pressure on the other side.

Part of the fuel flow from the pumps is routed back to the tank via the diaphragm-controlled cone valve (8), thus, establishing a pressure of 0.25 bar higher in the top chamber (fuel side)

than in the lower chamber (air side). Since the lower chamber is connected to the airbox via the pressure line, the pressure of the fuel entering the carburettor will also be 0.25 bar above airbox chamber pressure.

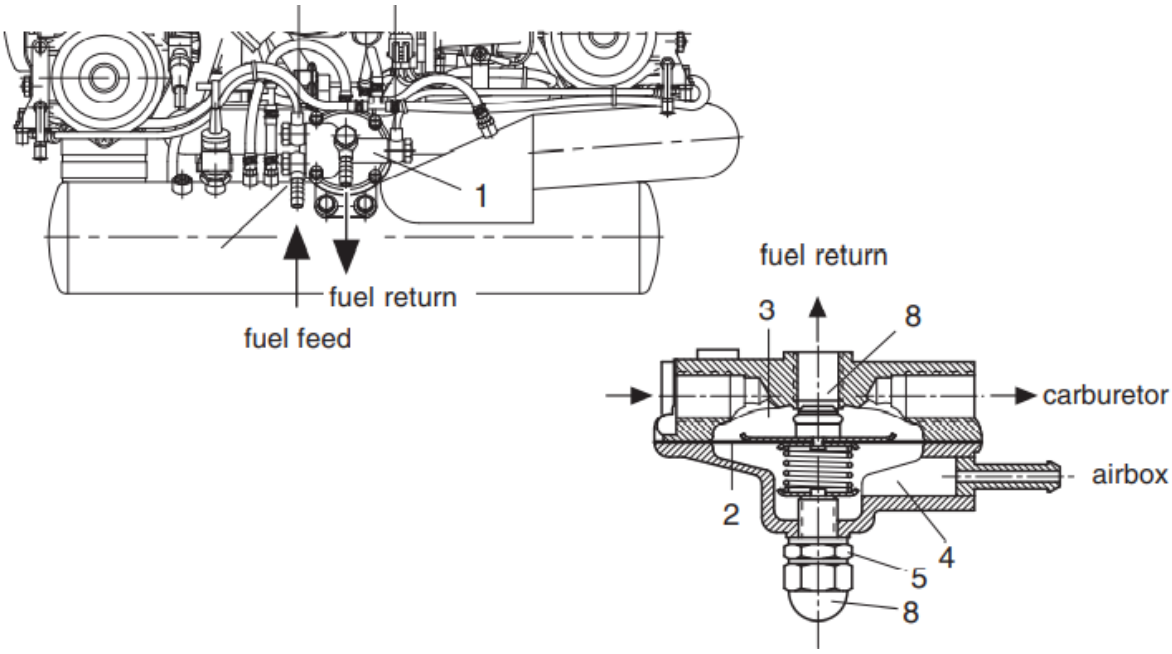

Figure 8: Fuel pressure regulator. (Source: Rotax 914 Maintenance Manual)

4.1) Sudden drop of boost pressure and speed

Sudden drop of boost pressure and speed

Any exceeding of the max. admissible engine speed or boost pressure has to be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding.

Loud noise or bang	
Possible cause	**Remedy**
Fracture of the turbo	Look for landing possibility.
	Flight with reduced performance may be possible.
	Monitor oil pressure.

Orange caution lamp of TCU (turbo control unit) is blinking	
Possible cause	**Remedy**
Wastegate does not close	Limited flying operation as possibly wastegate does not respond.

NOTE: A minimum performance of approx. 66 kW (88 HP) remains available.

Figure 9: Extract from the Rotax Operator's Manual.

4.4.3) Orange caution lamp of TCU blinking

Orange caution lamp of TCU blinking

In case of blinking of the orange caution lamp of TCU, this has to be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding limits.

NOTICE If the manually controlled variable is not possible, then turn off the servo motor.

Possible cause	Remedy
Indicates a failure of a sensor, sensor wiring, TCU, or leakage in the airbox	Reduce speed and boost pressure manually to be within the operating limits.
	Limited flying operation, as this may indicate the boost pressure control is no more or insufficiently possible and may affect engine performance.

Figure 10: Extract from Rotax Manual. (The pilot never saw this because this caution light never illuminated.)

1.18.2

ZU-IJZ Revision: Original Date 31/03/2017

Section 3
Emergency Procedures

ENGINE FAILURE AFTER TAKEOFF

Fly the aircraft to the ground. Do not become distracted with restart attempts and loose control. Establish best glide 55-60kts and maintain it. Choose a landing area ahead minimizing turns to line-up. Do not attempt to turn back to the field. Take half to full flaps to ensure the lowest possible landing speed. Sacrifice aircraft structure to minimize cabin damage.

ENGINE FAILURE AT ALTITUDE

Best glide, 55-60kts. Fuel starvation is the most likely cause of engine stoppage. Check tank selection and select fullest tank. If engine starts land as soon as practical.

ENGINE FIRE

On the ground: Fuel off, power off, evacuate aircraft.
In flight: Fuel selectors off. Master off. Emergency descent and land. Side slip in order to draft fire away from the cockpit area.

WARNING: The main fuel pump is connected to the ON position of the ignition key. Either switch the ignition to the OFF position, in which case all electrical equipment is switched off, or push the resettable main fuel pump circuit breaker on the right hand side of the panel until a distinct click is felt or the white part is visible. This is the off position for the breaker.

Figure 11: Emergency procedure after take-off extracted from the POH.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was made with respect to this accident. This shall not be read as apportioning blame or liability to any particular organisation or individual.

2.2. Analysis

2.2.1 The pilot was issued a National Pilot Licence on 5 September 2020 with an expiry date of 4 September 2022. The pilot's Class 4 aviation medical certificate was issued on 18 February 2019 with an expiry date of 18 February 2021, with no restrictions. Records indicated that the pilot was licensed and qualified to undertake the flight.

2.2.2 The AP who performed the last MPI on the aircraft prior to the accident flight was in possession of an Approved Person Certificate (404). The AP was issued an Approved Person Certificate on 17 February 2020 with an expiry date of 5 February 2022. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on this aircraft type.

2.2.3 The aircraft was issued an Authority to Fly (ATF) on 5 October 2020 with an expiry date of 31 October 2021. The aircraft was issued a Certificate of Registration (C of R) on 24 July 2019. The last MPI was conducted on 22 August 2020 at 159.91 airframe hours and the aircraft had flown a total of 10.67 hours since its last MPI. The aircraft was issued a Certificate of Registration to Service (CRS) on 22 August 2020 with an expiry date of 21 August 2021 or at 209.91 hours, whichever occurs first. During this inspection, the wastegate was inspected according to the maintenance requirements. Records indicated that the aircraft was airworthy and there were no recorded defects prior to the flight.

2.2.4 In December 2020, the aircraft was sent in for a turbo boost defect, which was rectified. During the rectification of that defect, no moving parts were replaced, only the wastegate lever was adjusted. The aircraft was test flown, and the defect signed out on 5 December 2020. According to the flight folio page serial number 0003, the aircraft was flown on 8 January 2021 for 1.4 hours by the owner and no issues were reported.

2.2.5 The pilot executed emergency procedures correctly when he levelled the aircraft to maintain airspeed as well as by selecting half flaps and choosing a clear area to land ahead on his flight path as outlined in the Rotax POH.

2.2.6 The pilot reported that there were no warning lights associated with the power loss or rough running of the engine during take-off, and both the temperature and pressure readings were normal. It is likely that the fuel pressure regulator malfunctioned for a short period, delivering a small amount of fuel when the throttle was fully open. This meant that the fuel pressure was under 0.25 bar and caused the engine to be under supplied with fuel, resulting in the turbo boost dropping and delivering reduced power which caused engine power loss. During the testing of the boost system after the accident, the wastegate cycle operation was tested and the wastegate flap cycled correctly; no abnormalities were found.

3. CONCLUSION

3.1. General

From the available evidence, the following findings, causes and contributing factors were made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusion heading:

- **Findings —** are statements of all significant conditions, events or circumstances in this accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.
- **Causes —** are actions, omissions, events, conditions or a combination thereof, which led to this accident.
- **Contributing factors —** are actions, omissions, events, conditions or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident occurring, or would have mitigated the severity of the consequences of the accident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

3.2. Findings

3.2.1 The pilot was issued a National Pilot Licence on 5 September 2020 with an expiry date of 4 September 2022. The pilot's Class 4 aviation medical certificate was issued on 18 February 2019 with an expiry date of 18 February 2021, with no restrictions.

3.2.2 The AP who performed the last MPI on the aircraft prior to the accident flight was in possession of an Approved Person Certificate (404). The AP was issued an Approved Person Certificate on 17 February 2020 with an expiry date of 5 February 2022. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on this aircraft type.

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3.2.5 In December 2020, the aircraft was sent in for a turbo boost defect which was rectified. During the rectification of that defect, no parts were replaced, only the wastegate lever was adjusted. The aircraft was test flown, and the defect signed out on 5 December 2020. The flight folio entries on the page with serial number 0003 showed that the aircraft was flown by the owner for 1.4 hours and no faults were recorded.

3.2.6 The pilot reported that the engine experienced power loss during take-off when the engine lost its turbo boost power and the pilot was forced to level the aircraft to maintain airspeed, all this occurred without any warning lights associated with power loss; he elected to execute a precautionary landing on the highway (gravel road) ahead of his flight path.

3.2.7 The pilot carried out emergency procedures well by levelling off to maintain the aircraft's airspeed and by taking on half flaps and choosing a suitable landing area ahead of his flight path as outlined in Rotax POH.

3.2.8 During testing of the boost system after the accident, the wastegate cycle operation was tested, and the wastegate flap cycled correctly; there were no abnormalities found. It is likely that during take-off, the fuel pressure was under 0.25 bar and caused the engine to be under supplied with fuel, resulting in the turbo boost dropping and delivering reduced power, which caused the engine power loss. As the aircraft was losing height and the engine could not sustain power, the pilot opted to execute a precautionary landing which was unsuccessful.

3.3. Probable Cause/s

3.3.1 It is likely that during take-off, the fuel pressure regulator failed, resulting in a drop of fuel pressure to below 0.25 bar and, thus, the engine was unable to provide sufficient power to sustain flight. The cause of the fuel pressure regulator failure could not be established as the tests did not reveal any abnormalities.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report. The AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1 None.

5. APPENDICES

5.1 None.

This report is issued by:

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