AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9039		
Aircraft Registration	**ZS-OCH**	**Date of Accident**	04 May 2012		**Time of Accident**	1620Z	
Type of Aircraft	Cessna U206G Stationair		**Type of Operation**		Private		
Pilot-in-command Licence Type	Private		**Age**	47	**Licence Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		Unknown		Hours on Type	Unknown	
Last point of departure	Piet Retief aerodrome (FAPF): Mpumalanga province.						
Next point of intended landing	Greytown aerodrome (FAGY):Kwa-Zulu Natal province.						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
In the vicinity ofStanger (Kwa-Dukuza) areainto theplantationsat GPS position determined to be; South 29° 03.297' East 030°37.856') at an elevation of 1144 feet above mean sea level (AMSL).							
Meteorological Information	Low clouds (stratus and possibly fog) were observed in the vicinity of Greytown area.**Stratus** clouds are uniform, greyish clouds that often cover the entire sky.						
Number of people on board	1 + 1	**No. of people injured**	0		**No. of people killed**	2	

Synopsis

On Friday afternoon 04 May 2012 at approximately 1530Z, the pilot accompanied by his wife departed Piet Retief aerodrome on a private flight bound for Greytown (FAGY) aerodrome. No flight plan was filed and the weather condition at the departure aerodrome was reported to be acceptable for Visual Flight Rules (VFR) flights. According to the witness who was at FAPF before ZS-OCH departed, the pilot carried out a pre-flight inspection where after the aircraft was refuelled. The engine was started and the aircraft taxied to the runway threshold where after pre take off checks were carried out. The aircraft took off normally. The aircraft had flown for approximately 123.64 nautical miles and close to the destination aerodrome the aircraft impacted rising terrain. A post impact fire erupted and all occupants werefatally injured. The aircraft was operated under Part 135 of the Civil Aviation Regulations.

Probable Cause

Controlled flight into terrain (CFIT).

IARC Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator :DE JA´C TRUST
Manufacturer :Cessna Aircraft Company
Model :Cessna U206G Stationair
Nationality :South African
Registration Marks :ZS-OCH
Place :In the plantations atKwa-Dukuza (Stanger area)
Date :04 May 2012
Time :1620Z

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

1. FACTUAL INFORMATION:

1.1 History of Flight:

1.1.1 On Friday afternoon 04 May 2012 at approximately 1530Z, the pilotaccompanied by his wife departed Piet Retief (FAPF) aerodrome (Mpumalanga province)on a private flight bound for Greytown (FAGY) aerodrome (Kwa-zulu Natal province). No flight plan was filed and the weather condition at the departure aerodrome was reported to be acceptable for Visual Flight Rules (VFR) flights.

1.1.2 According to the witness who was at FAPF before ZS-OCH departed, the pilot carried out a pre-flight inspection where after the aircraft was refuelled. The engine was then started and the aircraft was taxied to the runway threshold where after pre take off checks were carried out. The pilot selected the take-off power and commenced with the take-offrun.En-routesegment of the flight appeared to be normal however after 123.64 nautical miles from the departure aerodrome (FAPF), the aircraft impacted the risingterrain and a post impact fire erupted.

1.1.3 Somewitnesses in the Stanger (Kwa-Dukuza) area (the farmer and his family)located at a distance of approximately 1.69 nautical miles North of FAGYstatedthat they observed a small single engine Cessna aircraft flyingat arelatively low altitude, approximately 200 feet above ground level (AGL), with the navigation lights flashing routingin a South Westerly direction. The aircraft then executed a 180° turn just before the De Rust privat e aerodrome. They also recalled observing the aircraft making a right hand turn in aSouth Westerly direction alongside the R74 road.According to the witnesses there was an unusual noise (spluttering noise) emanating from the engine.

1.1.4 Approximately after 1.35 nautical miles the aircraft disappeared from their sightand a loud explosion was heard. The farmer immediately requested his wife and son to drive to the siteof the explosion to observe what have happened. After approximately 20 minutes, the farmer´s wife and son located the accident site just as the aircraft burst into flames.They reported that they couldn't get closer to the accident site because of the fire blaze and confirmed that there was no movement (occupants having survived) around the area.

1.1.5 The farmer´s wifeimmediately phoned 911on her mobile phone and reported the accident. 911 employees simultaneously phoned the South African Police Services (SAPS) and Emergency Medical Services (EMS) FAGY,who quickly drove to the site to assist and secured the area.The aircraft was destroyed by impact and post impact fire that erupted and both occupants were pronounced dead at the scene.

1.1.6 After the accident the daughter of the deceased, a student at Hermannsburg boarding School (located approximately 8.09 nautical miles, East of Greytown) informed one of the witnesses that she received a Short Message Service (SMS) on her mobile phone from her parents informing her that they will be leaving FAPF for FAGY at approximately 1530Z and that they will be performing a flight past by the site of the school.

1.1.7 The accident happened at night timein the plantations approximately 1.7 nautical miles just before the destinationaerodrome (FAGY) in the Stanger (Kwa-Dukuza) areaat GPS coordinates determined to be S29°03´297˝ E030°37´856˝ at an elevation of 1144 feetabove mean sea level (AMSL).

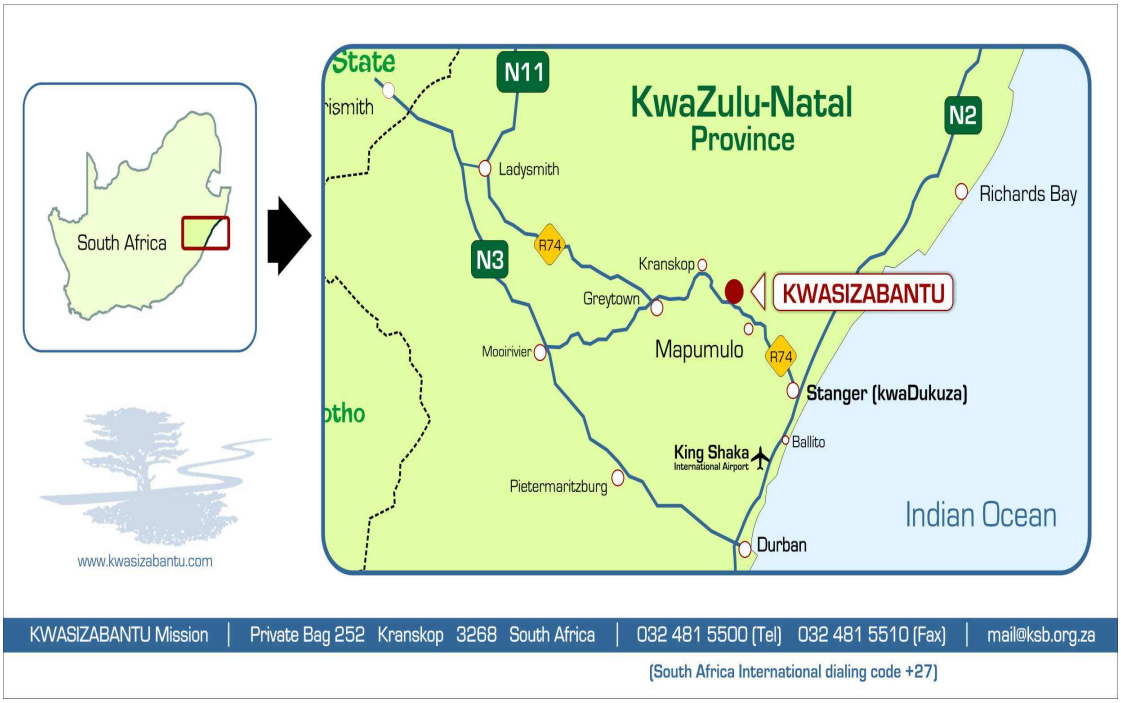


Figure1: Stanger (Kwa-Dukuza) area map.

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 by impact and post impact firethat erupted.

Figure 2: Aircraft wreckage, showing the extensive fire damage.

1.4 Other Damage:

1.4.1 Damage was limited to the treeson the farm.

1.5 Personnel Information:

Nationality	South African	Gender	Male	Age	47
Licence Number	0272267675	Licence Type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Night Rating				
Medical Expiry Date	31 August 2012				
Restrictions	Corrective lenses				
Previous Accidents	Nil				

*Note: The pilot was in a possession of a valid SA CAA issued pilot licence and was rated on aircraft type.

The CAA received the pilot's application for a student pilot's license on 15 October 2007, which was issued on the same day.

The CAA received the pilot's application pilot's license on 20 April 2008, which was also issued on the same day.

Flying Experience:

1.5.1 The pilot's log-book could not be found during the investigation. The flying hours below were obtained from the SACAA pilot's file, indicating his last pilot's licence renewal dated 14 April 2011. The total hours were also obtained from the logbook entry, which was on the pilot's file during his licence renewal.

Total Hours	351.7
Total Past 90 Days	48.7
Total on Type Past 90 Days	48.7
Total on Type	Unknown

1.6 Aircraft Information:

1.6.1 The Cessna U206G Stationairisan all metal, six seat, high-wing, single-engine aircraft, equipped with a tricycle landing gear and designed for general utility purposes. The aircraft may be flown from the left or right seat. However, the pilot flying usually occupies the left seat. Below is the photo of the aircraft.

Figure 3: View of the aircraft before the accident (photo found on internet).

Airframe:

Type	Cessna U206G Stationair	
Serial Number	U206-06344	
Manufacturer	Cessna Aircraft Company	
Date of Manufacture	1981	
Total Airframe Hours (At time of Accident)	5160.0	
Last MPI (Hours & Date)	5123.5	12 August 2011
Hours since Last MPI	36.5	
C of A (Issue Date)	18 July1997	
C of A (Expiry Date)	17 July 2012	
C of R (Issue Date) (Present owner)	11 August 2011	
Operating Categories	Standard Part 135	
Maximum take-off mass	1633 kilograms	
Recommended fuel used	Avgas LL 100	

*****NOTE: The Aircraft Maintenance Organisation (AMO) that performed the last maintenance on the aircraft prior to the accident flight was in possession of a valid AMO Approval certificate No 166.

Engine:

Type	Continental IO-520-F
Serial Number	553370
Hours since New	Unknown
Hours since Overhaul	Unknown

*****NOTE: The last Mandatory Periodic Inspection (MPI) carried out on the 12th ofAugust 2011 revealed that the aircrafttachometer was recording 5776.1 hours and the tachometer as found at the accident site was recording 5822.6 hours, which showed that the aircraft has flown a total of 46.5 hours since the last MPI.

Figure 4: View of the aircraft tachometer as found at the accident site.

Engine S/N 553370 was overhauled and installed on this aircraft on 07 January 1998 after engine S/N 286047-R was removed (timex). On 21 May 1998 the same engine S/N 553370 was removed due to cracks on number 01 cylinder at 4456.4 tachometer reading. Maintenance was carried out on the engine and was later fitted on the aircraft. Engine run + minor adjustments were carried out and the aircraft was released back to service.

Propeller:

Type	HartzelPHC-J3YF-1RF Blade model number:F868A-6R: Blades serial numbers: B#1 (K13094) B#2 (K13091) B#3 (K13089)
Serial Number	FP3325B
Hours since New	Unknown
Hours since Overhaul	226.2

*****NOTE: The last Mandatory Periodic Inspection (MPI) carried out on the 12th of August2011 revealed that the total propellerhours were at 189.7 and its time since midlife was at 189 hours.

1.6.2 Maintenance record held on Job card no **143/11**:

(i) Mandatory Periodic inspection (MPI) carried out.

(ii) Wiring checked on JPI, ADF, GPS and landing light.

(iii) Sky fox face re-secured.

(iv) New propeller governor fitted, Serial number 11203045.

(v) One new bearing fitted to the nose wheel.

(vi) Trim tab play checked and found serviceable and

(vii) New bulb fitted to landing light.

1.7 Meteorological Information:

1.7.1 Weather information was obtained from the SA Weather Services.

(a) Weather conditions at the time of the accident in the vicinity of FAGY.

(i) SURFACE ANALYSIS (1500Z 04 May 2012):
A low pressure system (coastal low) propagated North Eastwards along the Kwa-zulu Natal coast. This system causes an influx (South-Easterly to South-Westerly flow) of cool and moist maritime air into the South Eastern interior of Kwa-zulu Natal.

(ii) SATTELITE IMAGE.
A satellite is indicated at 850hPa in line with surface low pressure system. This trough broadens at 700hPa and gives way to zonal flow in the higher levels.

(iii) WEATHER CONDITIONS IN THE VICINITY OF THE ACCIDENT.
Two hourly meteorological aerodrome reports (METARs) from an automated weather station (AWS) in FAGY.

The report indicates moist conditions as the dry-bulb and dew-point temperatures were quite close to each other (18℃ and 16℃) respectively. The recorded winds were Southerly to South Westerly and the QNH increased between 1600 and 1700Z indicating that the coastal low had already moved North-Eastwards along the coast.

1.8 Aids to Navigation:

1.8.1 The aircraft was fitted with the following navigational aids.

(i) Magnetic compass.

(ii) Panel-mounted Garmin GPS 530.

(iii) Transponder.

(iv) ADF (Automatic Direction Finder).

(v) DME (Distance Measuring Equipment).

1.9 Communications:

1.9.1 The aircraft was fitted with standard communication equipment as approved by the regulator for this aircraft type. No abnormalities with communication equipment were reported and no evidence of any communication prior to the accident was found. The aircraft was not equipped with a Ground Proximity Warning System (GPWS).

1.10 Aerodrome Information:

1.10.1 FAGYis a privately-owned licensed aerodrome owned by Pannar Seed (PTY) LTD situated 09 kilometres North ofGreytown, Durban, with an elevation of 3 531 ft AMSL. The aerodrome has two active runways, 06/24 and prior permission is required for operation into the aerodrome.

1.10.2 The accident happened during night time conditions in the plantations inStanger (Kwa-Dukuza) areaat GPS coordinates determined to be S29°03´297˝ E030°37´856˝ at an elevation of 1144 feet above mean sea level (AMSL.

1.11 Flight Recorders:

1.11.1 Theaircraft 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 aircraft was routing in a South Westerly direction when it collided with the plantations at an altitude of 1144 feet above mean sea level (AMSL) and came torest approximately 94.3 metres from the initial point of contact with the

plantations.

1.12.2 The wreckage was contained within 120 feet from the first point of impact. The wreckage and the high degree of damage indicated that the aircraft had impacted the ground at a nose-low, wing level attitude at high speed. Due to the considerable amount of energy on impact with the plantations,both wingsfailed at their attachment points to the fuselage.

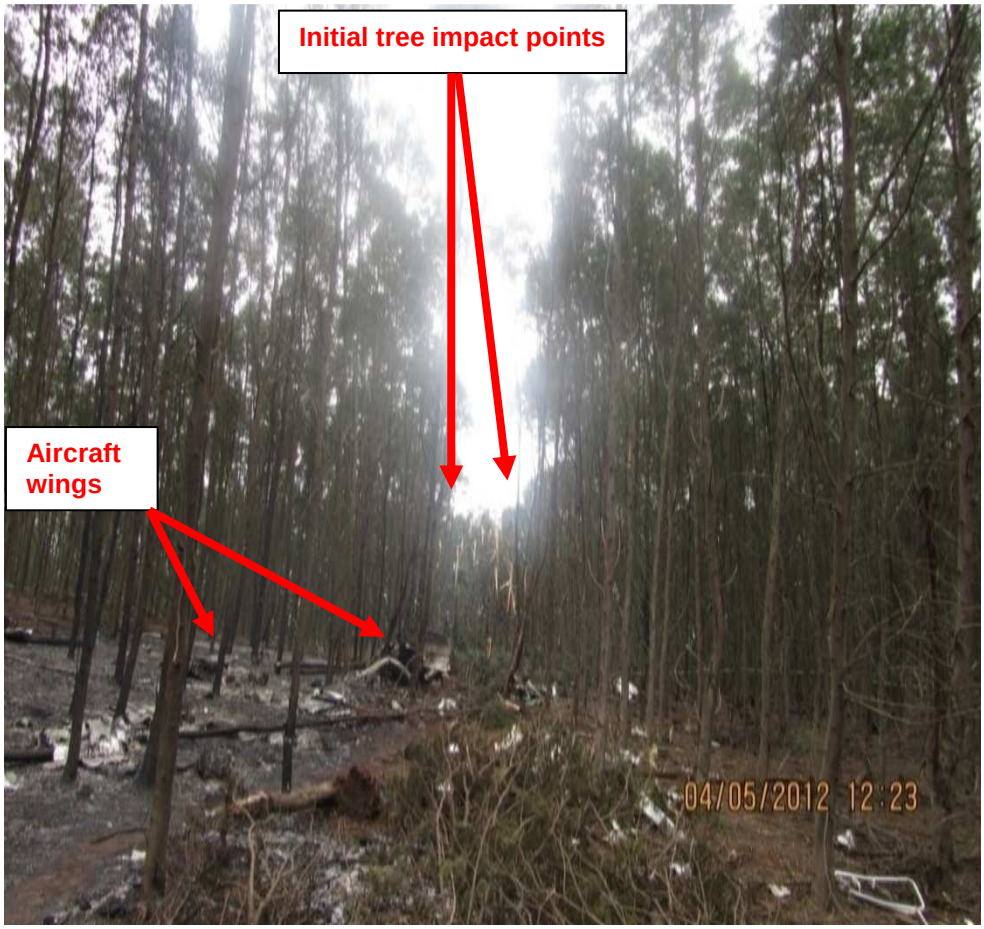


Figure 5: Flight path before impact and witness marks on the plantations.

1.12.3 The aircraft fuel cells ruptured during the accident sequence and post impact fire erupted and consumed the entire fuselage. This limited the detailed examination of the wreckage.

1.12.4 Theengine separated from the mountings and the propeller detached from the hub.Magnetos detached from the engine during the accident sequence and were found to have been damaged. See figure 6 below:

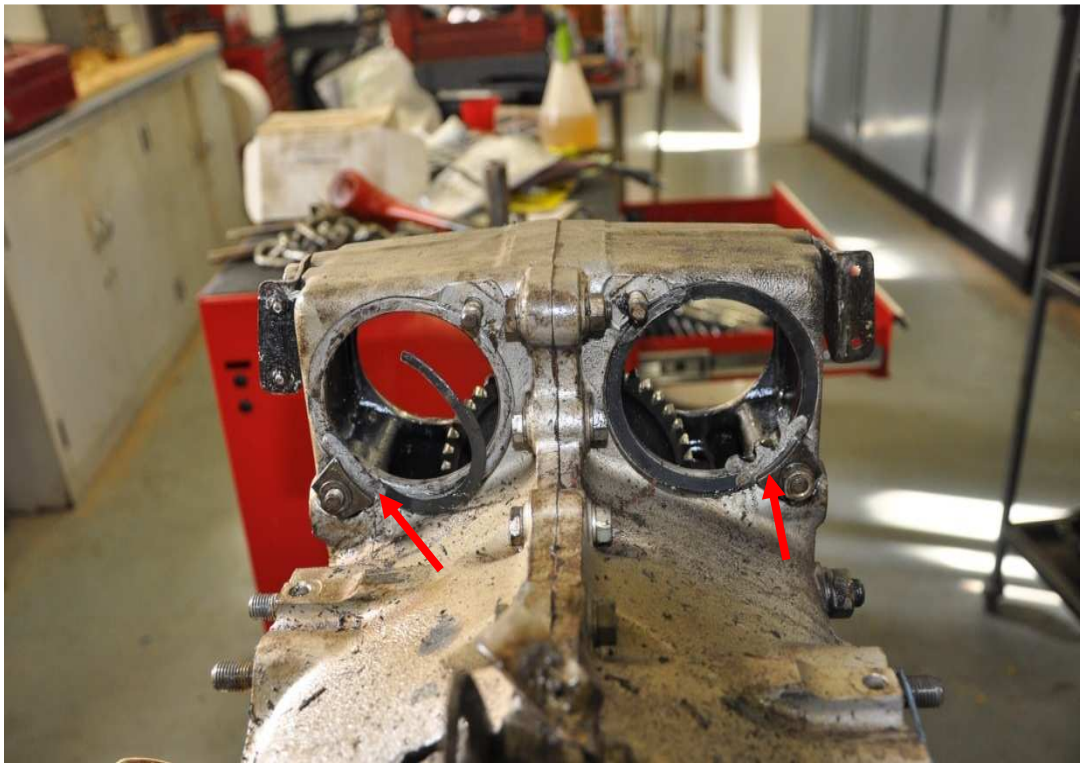


Figure 6: Evidence of Left and Right magnetos remains left on the engine casing.

1.12.5 Some engine components such as the alternator and theengine starter were not found at the accident site.The nose landing gear broke off after impact and the main undercarriage was destroyed by post impact fire.Post impact fire destroyed the entire engine instruments and the airspeed indicator, the vertical speed indicator, turn and bank co-ordinator,the magneticcompassand the attitude gyro provided no reliable information as to their reading at the time of impact.

1.13 Medical and Pathological Information:

1.13.1 Thepilot held a current SA CAA medical certificate and had a known eye-sight difficulties and was required to wear corrective lenses as a limitation of his medical certificate. The post-mortem and blood toxicology reports were still outstanding at the time of compiling this report. Should any of the results have a bearing on the circumstances leading to this accident; it will be treated as new evidence that will necessitate the reopening of this investigation.

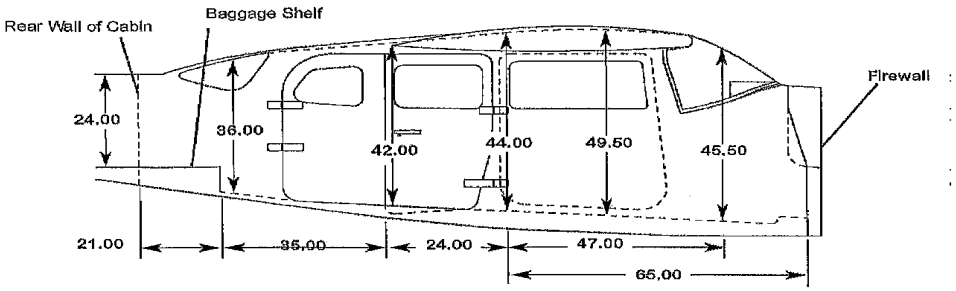
1.14 Fire:

1.14.1 No in-flight fire was reported.

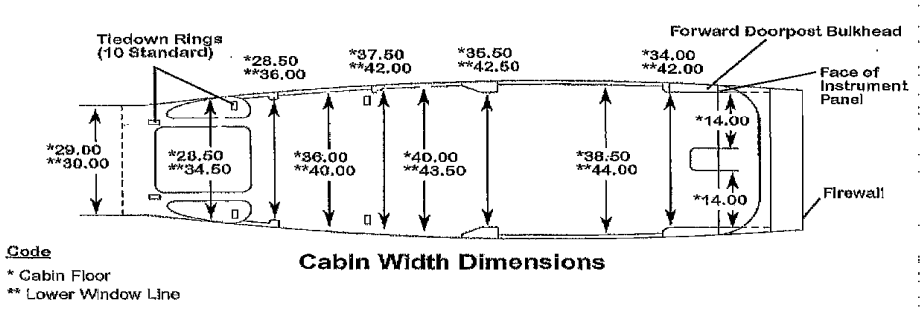
1.14.2 A post impact fire erupted on impact with the ground.

1.15 Survival Aspects:

1.15.1 This was considered a non-survivable accident due to the impact forces, the destruction of the cockpit area and the post impact fire that consumed the entire fuselage. Below is the cabin layout.



Cabin Height Dimensions



Cabin Width Dimensions

1.16 Tests and Research:

1.16.1 The aircraft was totally destroyed by post impact fire that erupted and no fuel was available for analysis. The investigation revealed that the aircraft had enough fuel for the planned flight. According to available aircraft documentation no reported defects were recorded since the last maintenance inspection was certified.

1.16.2 Investigation revealed no communication or any distress call madeby the pilot and on-site examination of the wreckage revealed that the aircraft had broken apart on impact withthe ground.

1.16.3 The engine (Continental IO-520Fserial number 553370) and the propeller were recovered from the accident site to an approved engine overhaul facility in Virginia aerodrome (Durban) for examination under the supervision of SA CAA investigators.

(a) During the investigation, the engine was set up together with the propellerto determinethe position of propeller blades to engine at the moment of impact when the propellerdetached from the engine. The fracture faces of the fractured crank and the propeller were positioned to fit as close as possible into each other.At this stage of the investigation no attempt was made to rotate the crank in the engine.

(b) During the engine strip down, it was evident that the crank could still rotate and no anomalies were detected. Suspected side on impact (right forward) side damaged propeller and crank flange with tree bark and fibre forced in between propeller attachment bolts. The evidence from this impact also suggests that the propeller was still turning on impact however the amount of power it was producing couldn't be determined by visual inspection. The position of the tree bark and fibres were found to be parallel to the sideways bending moment fracture line as it can be seen on figure 7 below.

Figure 7: View of the propeller attachment point (hub).

1.16.4 Propeller assembly strip down:

(a) On removal of the blades from the crank flange side hub half, it was found that the blade pitch pins sheared from the blade bases in different ways. The probable cause for this seems to be due to the different impact points and bending damage on the different blades. Other than the sheared pins and indentation damage caused by the blade hubs on the hub bases, no abnormalities could be detected with this part of the pitch change system.This suggests that the engine oil pressure was in fact available to activate the constant speed mechanism as this is the function of the throttle and the other cockpit settings. See figure 8 and 9 below.

Figure 8 and 9: Evidence of damage on the blades inside the hub.

- All crushed wires, pipes and baffles were removed. Due to the extent of damage on all sides of the engine it was not possible to investigate the fuel induction and ignition systems.
- Oil pump was removed: Internally no abnormalities could be found. The oil pump gears were turning freely and no overheat or dry run evidence could be found.
- The damaged starter gearbox was removed. No internal abnormalities could be found.
- The fuel pump was removed. Other than external damage the pump could still be turned by hand as normal.
- The spark plugs were removed and visually investigated. No evidence could be found that they were not operating normally.
- The rocker shafts and valve rockers were removed. Other than impact damage, no abnormalities could be found.
- Pushrod tubes and pushrods were removed. Other that impact damage no abnormalities could be found.
- Cylinder base nuts were removed and torque on all the nuts were found to be normal.
- Cylinders were removed one at a time, checking the condition of pistons and position of the ring gaps. Other than normal wear and external impact damage, no abnormalities could be found.
- The damaged sump was removed at the rear part of the sump fire. Damage was evident. No abnormalities noted.
- The crushed oil strainer was removed and no blockages or other abnormalities

were found.

- ❖ The piston pins were all checked for free rotational movement and were then removed with the pistons. No anomalies were found.
- ❖ The connecting rods were checked for normal movement on the big end bearings of the crankshaft and were found to be normal.
- ❖ Crankshaft rotation was then checked and was found to be able to rotate normally.
- ❖ The crank case was then split and the crank with connecting rods was removed to expose the main crank bearings. Other than normal wear, no abnormalities could be found with the main bearings.
- ❖ The cam shaft was removed and inspected. No abnormalities could be found with the camshaft and camshaft bearings.
- ❖ Cam shaft gear drive train was removed and inspected. No abnormalities were found as it can be seen on figure 10 below.

Figure 10: View of the crank shaft and severed flange.

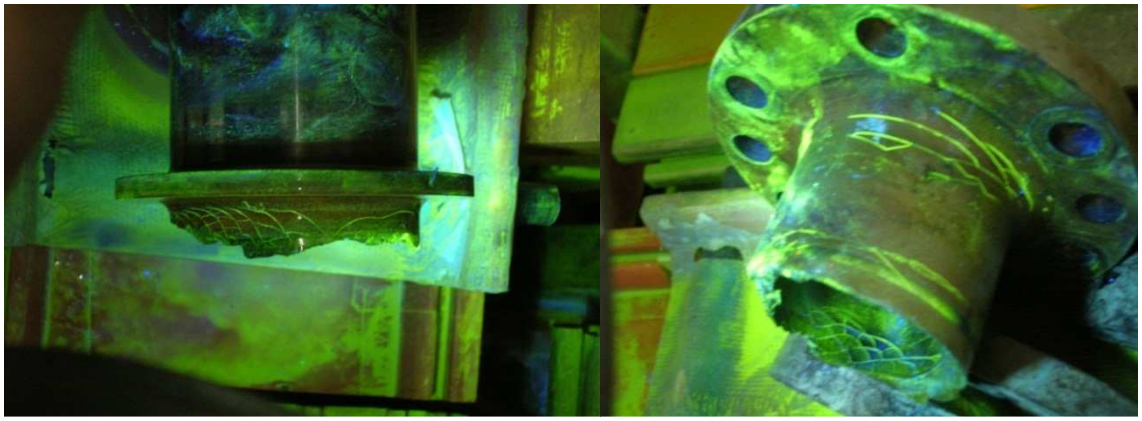
1.16.5 Non Destructive Test (NDT) inspection on the crankshaft:

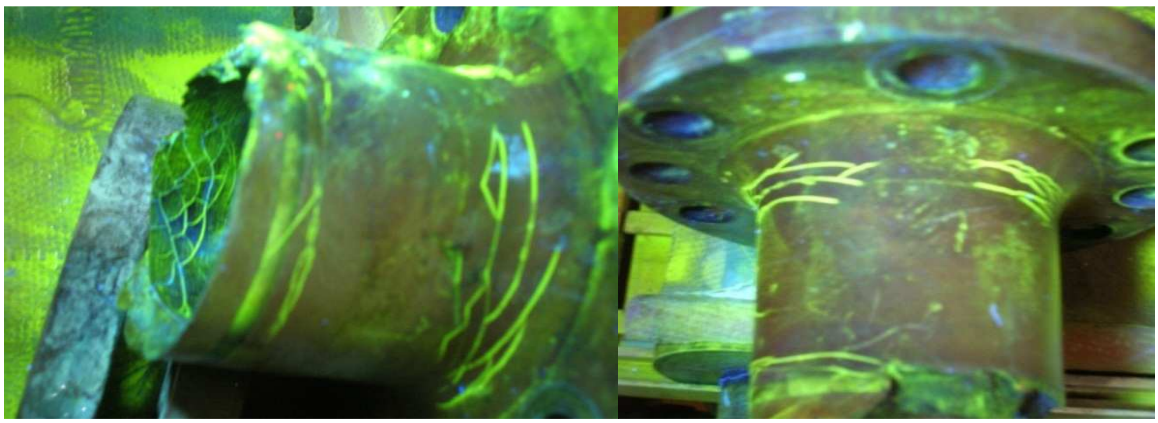
(a) The crank shaft and the fractured propeller flange were magnetized with direct current and coil magnetization technique.No other crack indications could be found in the rest of the crank shaft mainand big end journals.On inspecting the crankshaft multiple cracks were evident. These cracks emanate at a tangent angle from the main fracture line, suggesting that the crankshaft journal was partly fractured under the initial torque impact load as it can be seen on figure 11 below.

Figure 11: Evidence of damage on the crank shaft.

1.16.6 NDT inspection on the inner crankshaft flange:

(a) During the inner flange side inspection on the crank shaft impact cracks were evident on the outer surface, in the rear radius of the propeller flange. These impact cracks occur opposite of each other at 180 degrees and parallel to the fracture cracks on the inside of the hollow shaft, suggesting high sideways impact on the propeller. See the cracks from different angles on the picture 12, 13, 14 and 15 below.





1.17 Organizational and Management Information:

1.17.1 This was a private flight and the pilot was the co-owner of the aircraft.

1.17.2 The Aircraft Maintenance Organisation (AMO) that performed the last maintenance on the aircraft prior to the accident flight was in possession of a valid AMO Approval certificate No 166.

1.18 Additional Information:

1.18.1 Controlled Flight into Terrain (CFIT):

CFIT occurs when an airworthy aircraft, under the control of a pilot, is flown into terrain (water or obstacles) with inadequate awareness on the part of the pilot of the impending disaster (FAA, 2000). A number of general aviation (GA) weather accidents have been associated with external or social pressures, such as the pilot's reluctance to appear "cowardly" or to disappoint passengers eager to make or continue a trip. There is almost always pressure to launch, and pressure to continue. Even the small investment in making the trip to the airport can create pressure to avoid "wasted" time.

One of the most effective safety tools at a pilot's disposal is waiting out bad weather. Bad weather (especially involving weather fronts) normally does not last long, and waiting just a day can often make the difference between a flight with high weather risk and a flight that you can make safely.

Many times, weather is not forecast to be severe enough to cancel the trip, so pilots often choose to take off and evaluate the weather as they go. While it is not necessarily a bad idea to take off and take a look, staying safe requires staying alert to weather changes. GA pilots and their aircraft operate in (rather than above) most weather.At typical GA aircraft speeds, making a 200-mile trip can leave a two to three-hour weather information gap between the pre-flight briefing and the actual flight.

In-flight updates are vital!Because a single-piloted, small GA aircraft is vulnerable to the same CFIT risks as a crewed aircraft but with only one pilot to perform all of the flight and decision- making duties, that pilot must be better prepared to avoid a CFIT type accident. In some cases, a GA pilot may be more at risk to certain CFIT type accidents because the pilot does not have the company management or government oversight that a corporate or commercial operator may be exposed to.

Without such oversight, such as detailed standard operating procedures and higher mandatory safety requirements, it is the responsibility of the single pilot to ensure he or she is well trained, qualified for the intended flight, meets all regulatory requirements for the flight, and has the self-discipline to follow industry recommended safety procedures that can minimize CFIT type accidents.

The Instrument Procedure Handbook (FAA-H-8261-1A), Chapter 4, states:

The basic causes of CFIT accidents involve poor flight crew situational awareness. One definition of situational awareness is an accurate perception by pilots of the factors and conditions currently affecting the safe operation of the aircraft and the crew. The causes of CFIT are the flight crews' lack of vertical position awareness or their lack of horizontal position awareness in relation to the ground, water, or an obstacle. More than two-thirds of all CFIT accidents are the result of an altitude error or lack of vertical situational awareness. CFIT accidents most often occur during reduced visibility associated with instrument meteorological conditions (IMC), darkness, or a combination of both."

1.18.2 VFR – Low Ceilings:

"If you are not instrument rated, do not attempt "VFR on Top" or "Special VFR" flight clearances. Being caught above a solid cloud layer when an emergency descent is required (or at destination) is an extremely hazardous position for the VFR pilot. Accepting a clearance out of airport control zones with no minimum ceiling and one-mile visibility as permitted with "Special VFR" is a foolish practice for the VFR/non instrument rated pilot.

Avoid areas of low ceilings and restricted visibility unless you are instrument rated and proficient and have an IFR equipped airplane. Then proceed with caution and plan for alternates".

Reference: (POH, Section 10, Safety Information, Pg. 10-33)

1.18.3 Vertigo – Disorientation:

Disorientation can occur in a variety of ways. During flight, inner ear balancing mechanisms are subjected to varied forces not normally experienced on the ground. This combined with loss of outside visual reference can cause vertigo. False interpretations (illusions) result, and may confuse the pilot's conception of the attitude and position of his airplane.

Under VFR conditions, the visual sense, using the horizon as a reference, can override the illusions. Under low visibility conditions (night, fog, clouds, haze, etc) the illusions predominate. Only through awareness of these illusions, and proficiency in instrument flight procedures, can an airplane be operated safely in a low visibility environment.Flying in fog, dense haze or dust, cloud banks, or very low visibility, with strobe lights or rotating beacons turned on can contribute to vertigo. They should be turned off in these conditions, particularly at night.

All pilots should check the weather and use good judgement in planning flights. The VFR/non instrument rated pilot should use extra caution in avoiding low visibility conditions.

Motion sickness often precedes or accompanies disorientation and may further jeopardise the flight.Disorientation in low visibility conditions is not limited to VFR pilots. Although IFR pilots are trained to look at their instruments to gain an artificial visual reference as a replacement for the loss of visual horizon, they do not always do so. This can happen when the pilot's physical condition will not permit him to concentrate on his instruments; when the pilot is not proficient in flying instrument conditions in the airplane he is flying; or, when the pilot's work load of flying by reference to his instruments is augmented by such factors as turbulence.

Even an instrument rated pilot encountering instrument conditions, intentional or unintentional, should ask himself whether or not he is sufficiently alert and proficient in the airplane he is flying, to fly under low visibility conditions and in the turbulence anticipated or encountered.If any doubt exists, the flight should not be made or it should be discontinued as soon as possible.The result of vertigo is loss of control of the airplane. If the loss of control is sustained, it will result in an excessive speed accident.

Excessive speed accidents occur in one of two manners, either as an in-flight airframe separation or as a high speed ground impact; and they are fatal accidents in either case. All airplanes are subject to this form of accident.

1.18.4 Weather and Minimum Altitude Regulations:

- The flight from FAPF to FAGY was conducted under Visual Flight Rules (VFR) which requires to be conducted under the following conditions:

(i) Every VFR flight **shall** be so conducted that the aircraft is flown with visual reference to the ground by day and to identifiable objects by night and at no time above more than three eighths of cloud within a radius of five nautical miles of such aircraft.

(ii) In controlled airspace the flight visibility should be 5km and the distance from cloud of 2000 feet horizontally and 500 feet vertically. (Civil Aviation Regulations, Part 91, paragraph 91.06.21 and 91.06.21(a) of the Rules of the Air).

1.19 Useful or Effective Investigation Techniques:

1.19.1 Not applicable.

2. ANALYSIS:

2.1 Weather information obtained from the South African Weather Bureau indicated that low clouds (stratus and possibly fog) were observed in the vicinity of FAGY, Stanger (Kwa-Dukuza) area at the time of the accident. The aircraft was properly maintained and available maintenance documentation did not reflect any defect or malfunction that could have contributed or have caused the accident.

2.2 The pilot has been flying for several years and was in possession of a valid private pilot license. The pilot was also in possession of a valid aviation medical certificate and there was no indication that medical factors might have affected his performance at the time of the accident. The pilot was also appropriately rated on aircraft typeand had a valid night rating endorsed in his licence.

2.3 On-site investigation and examination of the aircraft revealed that the aircraft collided with terrain (CFIT) whilst routing in aSouth Westerly direction and was destroyed by impact and post impact fire that erupted.A comprehensive investigation was conducted followed by an engine strip/teardown and the results indicatedthat the engine was producing a substantial amount of power at the time of impact and the following must therefore be taken into consideration:

(i) Automated weather report from the South African Weather Bureau (SAWB) suggests that the aircraft was not operating under Visual Flight Rules (VFR) at the time of impact.The pilot was not instrument rated and the aircraft was fully Instrument Flight Rules (IFR) equipped.

(ii) There is a possibility that en-route to FAGY aerodromethe pilot entered Instrument Meteorological Condition (IMC), required an emergency descendand opted to fly alongside the R74 road as visual reference. With Stanger (Kwa-Dukuza) area being so unpopulated with little lighting at night("black hole" effect with minimum visual horizon) coupled with the pilot not being IFR rated, it is possible that he lost the attitude and position of the

aircraft.

(iii) Flying during low visibility conditionsand not IFR rated can cause disorientation or uncertaintythat candeceivethe pilot.The cruise phase of the flight is usually the safest, but ground lighting can lead to the pilot misperceiving the true horizon and putting the aircraft into a dangerous attitude. In dark night and adverse weather conditions, flying with reference to instruments is a necessity. If the pilot cannot see the horizon, it will be difficult for him or her to keep the aircraft straight and level without using instruments.

(iv) Below are pictures whereby marginal visual clues are not available to help the pilot familiarise himself/herselfrelation to the earth, he or she may have the false impression of being upright.

Figure 16: Black hole image.

(v) The aircraft was equipped with aGaminMODE Stransponder capable of transmitting and receiving signals from the ground and then automatically replying with an identification code for air traffic controllers in order to make the aircraft more visible on radarwhich the pilot unfortunately did not make use of.

2.4 According to the Aeronautical Information Publication (AIP) under FAGY,**ONLY** Instruments Flight Rules (IFR) rated pilots may operate at night time. The pilot most probably never acquainted himself with the AIP´s nor was he aware of the requirement by the South African Civil Aviation Authority (SA CAA).It is the responsibility of the pilots to consult with the AIP´s, the Aeronautical Information Circulars (AIC´s); Notice to Airmen (NOTAMS) so that they be aware of local airspace requirements and take steps to avoid infringing them.

3. CONCLUSION:

3.1 Findings:

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

3.1.2 The pilot had a known eye-sight difficulties and was required to wear corrective lenses as a limitation of his medical certificate.

3.1.3 The pilot did not comply with the Civil Aviation Regulations of 1997, Part 91, paragraph 91.06.21 and 91.06.21(a) of the Rules of the Air, while flying under VFR flight rules: "Every VFR flight shall be so conducted that the aircraft is flown with visual reference to the surface by day and to identifiable objects by night and at no time above more than three eighths of cloud within a radius of five nautical miles of such aircraft."

3.1.4 The aircraft impacted the ground in a South Westerly direction and post impact fire erupted.

3.1.5 The aircraft had a valid Certificate of Registration.

3.1.6 Examination of the engine revealed no evidence of anomalies or deficiencies.

3.1.7 The bad weather conditions that prevailed in the Stanger (Kwa-Dukuza) area were considered to have had a bearing on the accident.

3.1.8 The accident was considered not survivable.

3.2 Probable Cause/s:

3.2.1 Controlled flight into terrain (CFIT).

3.3 Contributing factor/s:

3.3.1 None.

4. SAFETY RECOMMENDATIONS:

4.1 None.

5. APPENDICES:

5.1Aeronautical Information Publication (AIP) Information:

AD 2 AERODROMES

FAGY AD 2.1 Aerodrome Location Indicator And Name

FAGY - GREYTOWN (315)

FAGY AD 2.2 Aerodrome Geographical And Administrative Data

1	ARP Coordinates and site at AD	S290724,76 E0303456.20
2	Direction and distance from city	9 KM North to Greytown
3	Elevation / Reference temperature	Elev: 3531 FT
5	MAG VAR / Annual change	22°W (2003)
6	AD Administration, address, telephone, telefax, telex, AFS	Authority Supervising the Aerodrome and Remarks: PRIVATE AD Pannar Seed (PTY) Ltd. P O Box 19 Greytown, 3250 Contact person: Mr K Walters Tel: (033) 41 33471/2 (Office hours) Fax: (033) 41 33477
8	Remarks	1) Prior permission required. Instrument rated pilots only for night OPS. 2) Landing fees applicable to all aircraft.

FAGY AD 2.3 Operational Hours

1	AD	H24

FAGY AD 2.12 Runway Physical Characteristics

Designations RWY NR	TRUE & MAG BRG	Dimensions of RWY (M)	Strength (PCN) and surface of RWY and SWY	THR coordinates	THR elevation and highest elevation of TDZ of precision APP RWY
1	2	3	4	5	6
06 24	041°T/060°M 221°T/240°M	1462 x 11	ASPH LCN 30		1078.24M 1058.31M

For: Director of Civil Aviation

Compiled by: Frans Malose Motaung Date: 12 July 2012

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