



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

| | | | | | | |
|---|-----------------|--|--------------------------|-----------------------------|-------------------------|-------|
| | | | | Reference: | CA18/2/3/8550 | |
| Aircraft Registration | ZU-EHD | Date of Accident | 11 September 2008 | | Time of Accident | 1000Z |
| Type of Aircraft | Auto gyro MT 03 | | Type of Operation | | Private | |
| Pilot-in-command Licence Type | | Private | Age | 52 | Licence Valid | Yes |
| Pilot-in-command Flying Experience | | Total Flying Hours | 48 | | Hours on Type | 48 |
| Last point of departure | | Harrismith Aerodrome (FAHR), Free State | | | | |
| Next point of intended landing | | Port St John's Aerodrome, Eastern Cape | | | | |
| Location of the accident site with reference to easily defined geographical points (GPS readings if possible) | | | | | | |
| Farm Scheepershoek between Harrismith and Bergville. (GPS co-ordinates: S28° 33' 160" E029° 09' 988" at an elevation of 5 165 ft AMSL) | | | | | | |
| Meteorological Information | | Strong north-westerly wind, dense fog, low cloud (reduced visibility), temperature 11 °C | | | | |
| Number of people on board | 1 + 1 | No. of people injured | 0 | No. of people killed | 1 + 1 | |
| Synopsis | | | | | | |
| <p>On 11 September 2008 at approximately 0500Z, a group of gyrocopters took off from Kitty Hawk Aerodrome (FAKT) on a pleasure weekend fly-away to Port St John's Aerodrome. En route to Port St John's, they landed at Harrismith Aerodrome to refuel and later took off again with the intention of landing at Dragon's Peak for a sleep-over.</p> <p>As they were flying over the Sterkfontein dam / Drakensberg area, they experienced low clouds and dense fog. They decided to go back to Harrismith, but during the return journey, one of the gyrocopters flew into the bad weather and was subsequently reported missing.</p> <p>The gyrocopter was later found by farm workers on farm Scheepershoek, which is situated between Harrismith and Bergville.</p> <p>The aircraft was destroyed by fire and the occupants had been fatally injured.</p> | | | | | | |
| Probable Cause | | | | | | |
| Controlled flight into terrain under instrument meteorological conditions (IMC). | | | | | | |
| IARC Date | | | | Release Date | | |



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : WJ Le Roux
Manufacturer : Auto Gyro Europe
Model : MT 03
Nationality : South African
Registration Marks : ZU-EHD
Place : Scheepershoek farm, between Harrismith and Bergville
Date : 11 September 2008
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 given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 On 11 September 2008 at approximately 0500Z, a group of five gyrocopters took off from Kitty Hawk Aerodrome (FAKT) on a pleasure weekend fly-away to Port St John's Aerodrome. While in flight, they were joined by one gyrocopter from Springs.
- 1.1.2 They landed at Harrismith Aerodrome at approximately 0700Z to refuel and meet up with another two gyrocopters. All gyrocopters later took off from Harrismith at approximately 0930Z with the intention of landing at Dragon's Peak for a sleep-over. Ten minutes into the flight, as they were flying over the Sterkfontein dam area en route to Dragon's Peak, they observed bad weather in the form of dense fog and low clouds ahead of them, in the vicinity of the escarpment beyond the dam.
- 1.1.3 The seven gyrocopters circled around the Sterkfontein dam area at an altitude of approximately 500 ft above ground level (AGL), while one climbed approximately 1 000 ft (to $\pm 1\ 500$ ft) for approximately five minutes to see if the weather was not clearer on the other side of the escarpment. Upon observing that the bad weather covered a considerable area ahead of them and that he could only see the peak of the Drakensberg mountain, the pilot descended towards the rest of the group and suggested to them that they should fly back to Harrismith, as most of the pilots were not instrument rated and did not have much gyrocopter experience.
- 1.1.4 One of the more experienced pilots, who was in possession of an Airline Transport Pilot Licence (ATPL) decided to go ahead and observe the mountain peak. He was followed by one gyrocopter, and the pair later proceeded to Dragon's Peak and

landed safely. The other gyrocopters turned back towards Harrismith.

- 1.1.5 One of the pilots of the other gyrocopters stated that some time after having turned back for Harrismith, he heard the voice of the accident aircraft's passenger over the radio calling for help, saying God help my, help my God (in Afrikaans). When they arrived at Harrismith, they confirmed that one gyrocopter was missing. They tried to contact the pilot on the radio but they could not reach him and they immediately notified search and rescue services using their mobile phones.
- 1.1.6 The owner of farm Scheepershoek, which is situated between Harrismith and Bergville, and the farm workers indicated that they heard aircraft flying past the area at approximately 1000Z, but they could not see them from the ground due to the bad weather conditions that prevailed at that time.
- 1.1.7 The farm workers then saw fire and smoke rising from a point on the farm, which was later established as the accident site. They rushed to the scene and when they arrived there they found the aircraft engulfed in flames that they could not extinguish. The farmer notified the local police, and when the police got to the scene, they found that the aircraft was destroyed by fire and the occupants had been fatally injured.

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.



Figure 1: Damage to aircraft

1.4 Other Damage

1.4.1 There were no other damages.

1.5 Personnel Information

1.5.1 Pilot-in-command:

| | | | | | |
|---------------------|-------------------|---------------|---------------------|-----|----|
| Nationality | South African | Gender | Male | Age | 52 |
| Licence Number | ***** | Licence Type | Private (Gyroplane) | | |
| Licence Valid | Yes | Type Endorsed | Yes | | |
| Ratings | None | | | | |
| Medical Expiry Date | 30 September 2009 | | | | |
| Restrictions | None | | | | |
| Previous Accidents | None | | | | |

1.5.2 Flying Experience:

| | |
|----------------------------|---------|
| Total Hours | 48 |
| Total Past 90 Days | Unknown |
| Total on Type Past 90 Days | Unknown |
| Total on Type | 48 |

Note: According to available records, on 19 January 2007 the pilot had flown 20.1 hours dual and a total of 27.9 hours on the aircraft type, but because of the unavailability of the pilot's log book, the pilot's exact flying hours at the time of the accident could not be determined.

1.6 Aircraft Information

1.6.1 Airframe:

| | | |
|--|-------------------|-----|
| Type | MT 03 Gyrocopter | |
| Serial Number | 08 ZA 2006 | |
| Manufacturer | Auto Gyro Europe | |
| Year of Manufacture | 2006 | |
| Total Airframe Hours (At Time of Accident) | Unknown | |
| Last Annual Inspection (Date & Hours) | 03 October 2007 | 134 |
| Hours Since Last Annual inspection | Unknown | |
| Authority to Fly (Issue Date) | 04 October 2007 | |
| C of R (Issue Date) (Present Owner) | 04 October 2007 | |
| Operating Categories | Private operation | |

1.6.2 Engine:

| | |
|----------------------|-----------|
| Type | Rotax 914 |
| Serial Number | 4419303 |
| Hours Since New | Unknown |
| Hours Since Overhaul | Unknown |

1.6.3 Propeller:

| | |
|----------------------|----------------|
| Type | HTC 172 CCW 3B |
| Serial Number | 113 |
| Hours Since New | Unknown |
| Hours Since Overhaul | Unknown |

Note: According to available records, the last annual inspection was performed and certified on 03 October 2007 at 134 hours, but because of the unavailability of the airframe, engine and propeller log books, the exact hours at the time of the accident could not be determined.

1.7. Meteorological Information

1.7.1 Below is the weather report and satellite picture as given by South African weather services.

1.7.1.1 Surface analysis

A surface high-pressure system was ridging along the coastline and a surface trough was to the west of the area of the accident.

1.7.1.2 Upper air analysis (500 hPa)

Strong north-westerly winds were blowing.

1.7.1.3 Meteorological conditions (interpolated)

Temperature: 11°C
Visibility: 8 km
Dew point: 8°C
Freezing: 1000 ft
QNH: 1027 mb

1.7.1.4 NB: No actual observations were present at the time and site of the accident. The information in 1.7.1.3 was derived using actual values from nearby areas.

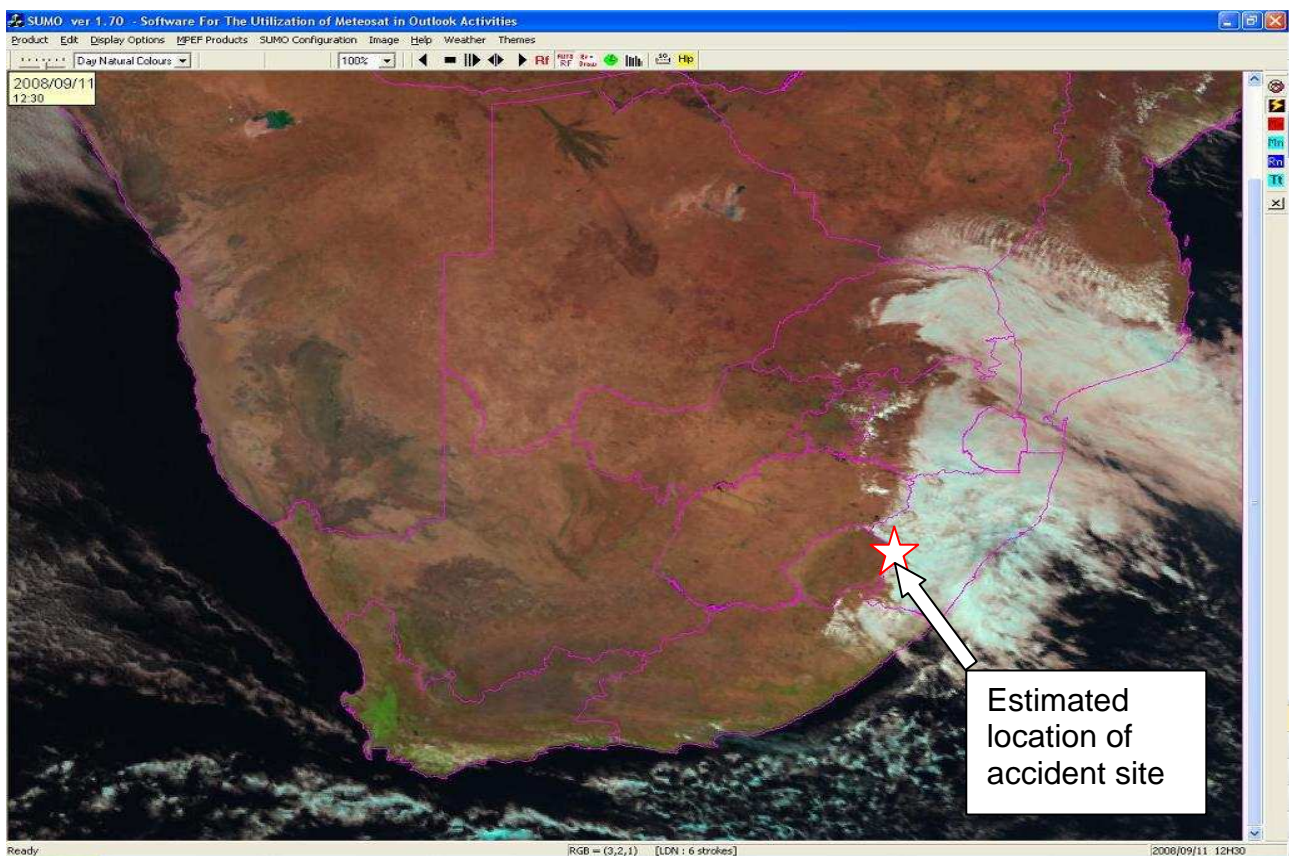


Figure 2: The weather conditions in the vicinity of the accident site at the time of the accident

1.8 Aids to Navigation

- 1.8.1 The aircraft was fitted with standard navigation equipment as approved at the time of certification by the regulator, and no defects were entered against this equipment prior to the accident or during the accident flight.

1.9 Communications

- 1.9.1 The aircraft was fitted with standard communication equipment as approved at the time of certification by the regulator, and no defects were entered against this equipment prior to the accident or during the accident flight.
- 1.9.2 One of the pilots was making radio calls on VHF frequency 124.8 MHz and the group was communicating to each other over 123.45 MHz chat frequency.
- 1.9.3 The last communication from the aircraft was of the passenger calling for help.

1.10 Aerodrome Information

- 1.10.1 The accident did not occur at an aerodrome. It occurred on a mountainous, sloping, firm, rocky ground at a private farm (Scheepershoek) between Harrismith and Bergville. The GPS co-ordinates are S28° 33' 160" E029° 09' 988" at an elevation of 5 165 ft AMSL.



Figure 3: The terrain of the accident site

1.11 Flight Recorders

1.11.1 Neither a flight data recorder (FDR) nor a cockpit voice recorder (CVR) was fitted on this aircraft, and neither was required by the regulations.

1.12 Wreckage and Impact Information

1.12.1 The aircraft was heading in a north-easterly direction (a heading of approximately 045°) when it impacted an outcropped rock. The aircraft then bounced for approximately 4 m, rolled towards the right and the rotor blade struck the ground. The tip of the rotor blade departed the aircraft and was flung towards the right side of the aircraft. The aircraft then impacted the ground, the fuel tank ruptured and the aircraft skidded for approximately 12 m before coming to rest in a heading of 180°.

1.12.2 A post-impact fire then erupted and destroyed the aircraft. The fire also spread to the vegetation where the fuel tank ruptured and all other areas with fuel residue.

1.12.3 The distances from the main wreckage to the points where the aircraft first impacted the rock, where the rotor blade struck the ground and where the aircraft impacted the ground and fuel tank ruptured were established to be approximately 20 m, 16 m and 12 m respectively.

1.12.4 Although the rotor blade tip was found 26 m from the main wreckage, most of the debris was found within a 15 m radius from the main wreckage.

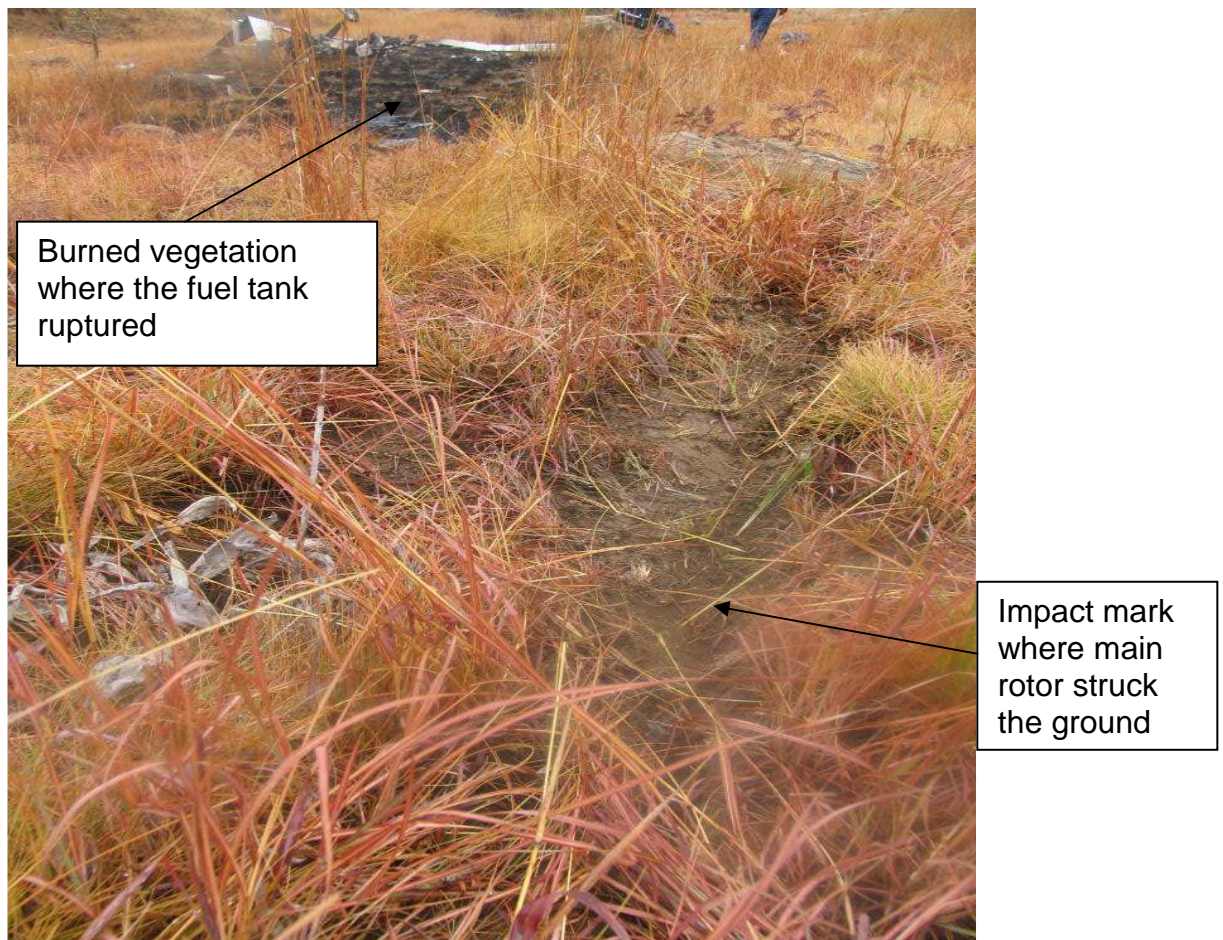


Figure 4: The accident impact marks

1.13 Medical and Pathological Information

1.13.1 Both the pilot and the passenger were fatally injured in the accident.

1.13.2 The post-mortem and toxicology reports were not available at the time of compilation of this report. Should these results have a positive bearing to this report, they will be attached to this report as and when obtained.

1.14 Fire

1.14.1 A post-impact fire burnt out the aircraft completely.

1.15 Survival Aspects

1.15.1 Because of the damage to the aircraft and the post-impact fire that destroyed the aircraft, the accident was considered not survivable.

1.16 Tests and Research

1.16.1 The engine was taken to an approved aircraft maintenance organisation (AMO) for a teardown inspection. The teardown inspection was carried out by an approved person in the presence of the investigator in charge. No damage that could have led

to an in-flight stoppage of the engine could be found. The engine teardown report is attached in Appendix 1.

1.17 Organisational and Management Information

1.17.1 The pilot had a valid gyrocopter pilot licence.

1.17.2 The pilot had no instrument rating.

1.17.3 This was a private pleasure flight.

1.17.4 The aircraft was privately owned and was maintained by an approved person (AP) accredited by the Aero Club of South Africa.

1.17.5 The aircraft had a valid authority to fly, with an expiry date of 03 October 2008.

1.18 Additional Information

1.18.1 According to the pilots of the other gyrocopters, the accident aircraft seemed fine, without any anomalies, at Kitty Hawk and Harrismith, and the pilot also seemed to have no concerns with respect to any anomalies. Furthermore, the pilot did not report any problems before or during the flight.

1.18.2 The aircraft was not equipped for instrument meteorological conditions (IMC) flight.

1.19 Useful or Effective Investigation Techniques

1.19.1. None.

2. ANALYSIS

2.1 The flight was a private weekend fly-away. The pilot had a valid gyrocopter licence and flight medical certificate, but was not rated to fly in instrument meteorological conditions (IMC). According to available records, on 19 January 2007 the pilot had flown 20.1 hours dual and a total of 27.9 hours on the aircraft type.

2.2 There was no evidence of maintenance anomalies and/or defects with the aircraft prior to the flight reported or experienced by the pilot. No major defects or concerns were reported during the last annual inspection at 134 airframe hours and the annual inspection was certified without any noted problems. During the investigation, no damage to the engine was found that could have led to or contributed to the accident.

2.3 The eight gyrocopters took off from Harrismith in visual meteorological conditions (VMC), and they had been in flight for ten minutes when they observed bad weather ahead of them. Five gyrocopters decided to return to Harrismith after having circled the Sterkfontein dam area for approximately ten minutes because they realised that it would have been dangerous and unsafe to continue to Dragon's Peak. Two gyrocopters proceeded to Dragon's Peak and landed safely.

- 2.4. When one of the gyrocopters did not arrive at Harrismith as expected, search and rescue services were informed and a search mission was initiated. The wreckage of the aircraft was found on a farm in the mountains by farm workers. The pilot and passenger were fatally injured in the accident.
- 2.5. A possibility exists that the pilot of the accident aircraft could have contemplated following the two other gyrocopters that continued to Dragon's Peak, or it could have just taken him longer than the other pilots to turn back, thus ending up in the clouds ahead of him.
- 2.6. In either of the possibilities mentioned above, the pilot ended up in IMC. Because he was not instrument rated, he might have tried to get below the clouds, and because the clouds were very low, the aircraft impacted the ground and the fuel tank ruptured, and the aircraft caught fire and was destroyed.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot had a valid gyrocopter pilot licence.
- 3.1.2 The pilot had no instrument rating.
- 3.1.3 This was a private pleasure flight.
- 3.1.4 The aircraft was privately owned and was maintained by an approved person (AP) accredited by the Aero Club of South Africa.
- 3.1.5 The aircraft had a valid authority to fly, with an expiry date of 03 October 2008.
- 3.1.6 No damages to the engine were found that could have contributed to the accident.
- 3.1.7 The gyrocopters took off from Harrismith in VMC and ten minutes into flight from Harrismith, they observed IMC ahead of them.
- 3.1.8 The pilot flew into IMC, for which neither him nor the aircraft were certified or equipped.

3.2 Probable Cause/s

- 3.2.1. Controlled flight into terrain under instrument meteorological conditions (IMC).

4. SAFETY RECOMMENDATIONS

- 4.1. None.

5. APPENDICES

- 5.1. Appendix 1 – Engine teardown inspection report

APPENDIX 1:

Engine teardown inspection report

INVESTIGATION
REPORT

ENGINE SERIAL No.:

~~1~~4419303
P. 10/10

AIRCRAFT REGISTRATION
ZU - EHD

INVESTIGATION REPORT

ROTAX 914 UL
SERIAL No.: 14419303
AIRCRAFT REGISTRATION ZU - EHD
AIRCRAFT TYPE: GYROPLAIN MT03

Purpose:

To determine any mechanical failure (externally and internally) during the disassembly process of the engine, which could have caused engine stoppage or engine failure during flight.

Processes:

Visual inspection was conducted on all external and internal parts for signs of mechanical or part failure.

NOTE:

Due to excessive heat caused by the fire during the accident, no statement regarding some mechanical or electrical system could be given. Parts affected are the following.

1. Turbo controls unit. (TCU)
2. Air box managing system.
3. Fuel flow system. (Carburetor's)
4. Electrical supply. (Ignition unit)
5. Propeller.
6. Pre-rotator system.
7. Oil delivery system. (Oil lines)

1. EXTURNAL INSPECTION

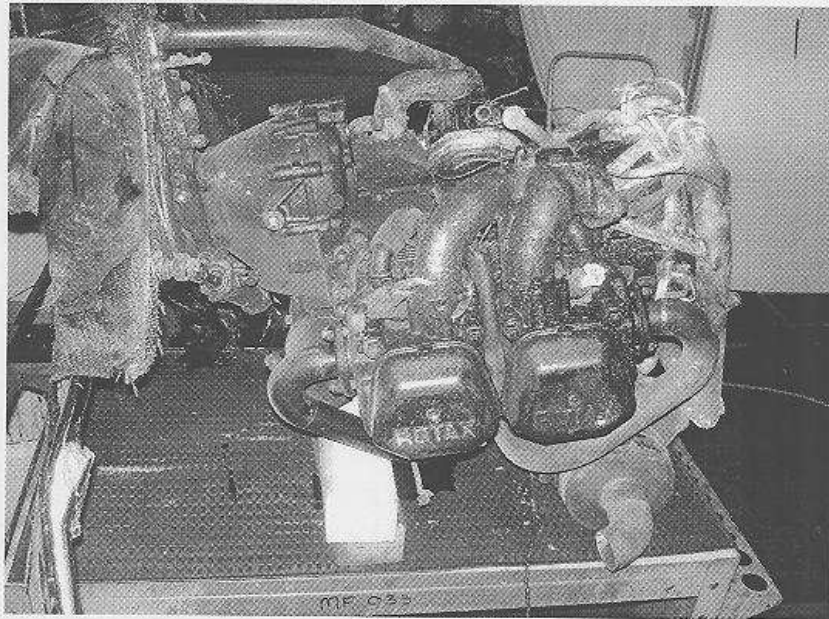


Figure 1

Visual external inspection on the following parts were conducted witch includes the following. See figure 1and 2

1. Engine frame attachment bolts and anchor points.
2. Turbo fan bearing fore free movement.
3. Exhaust flow system.
4. Cylinder heads.
5. Gearbox assembly.
6. Prerotator system.
7. Propeller and hub assembly.

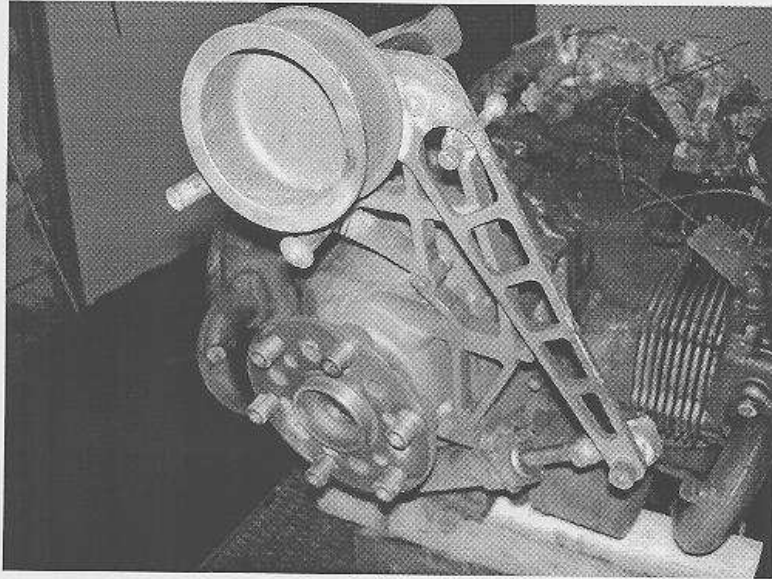


Figure 2

FINDINGS:

No damage to the external mechanical parts were detected which could have led to engine failure or engine stoppage.

Note:

Figure 3 – 6 are components which were totally destroyed during the fire and no comments could be stated.

1. Electrical supply. (Ignition unit)
2. Fuel system. (Carburetor's)
3. Fuel intake manifold.

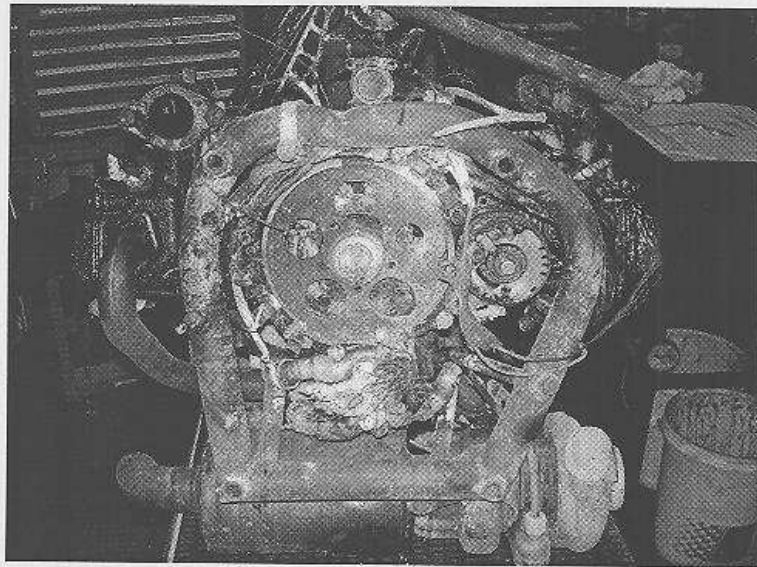


Figure 3 Ignition unite

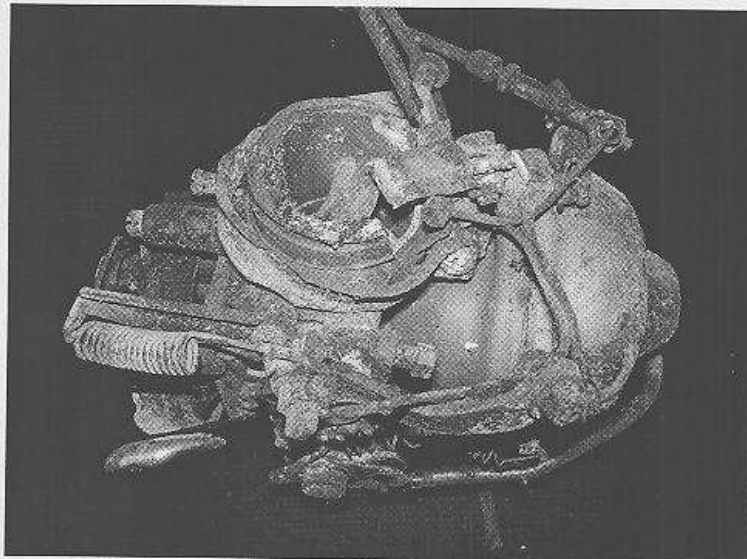


Figure 4 Carburetors

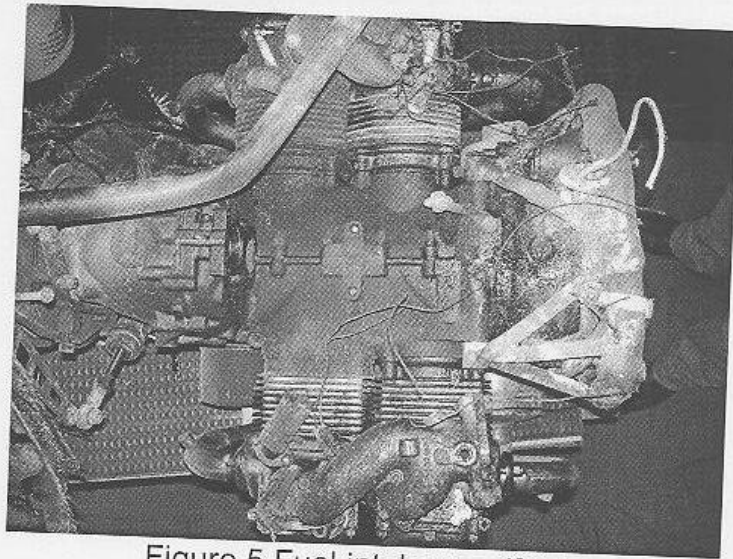


Figure 5 Fuel intake manifolds

2. INTERNAL INSPECTION

During the internal inspection, the magnetic plug was removed. The plug revealed no signs of excessive metal particle witch were normal due to engine wear. See Figure 7.

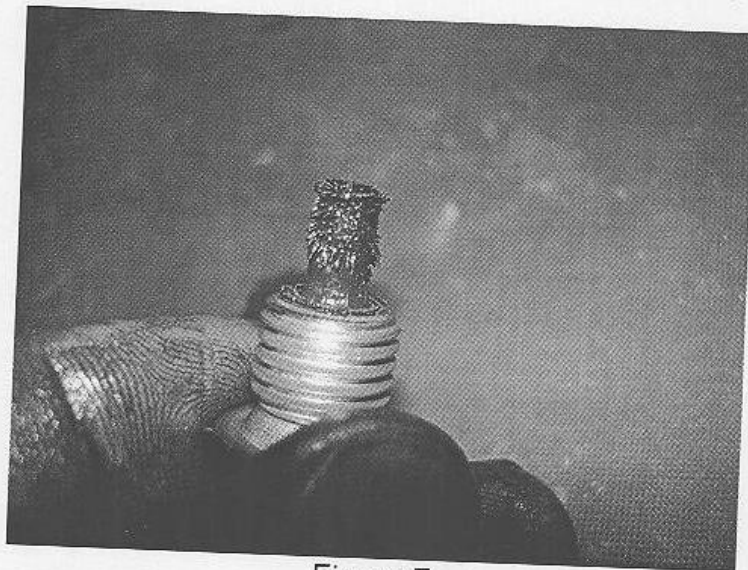


Figure 7

The ignition housing was disassembled and no mechanical failure was detected to the water pump drive gear sprag clouts and starter gear drive. See figure 8

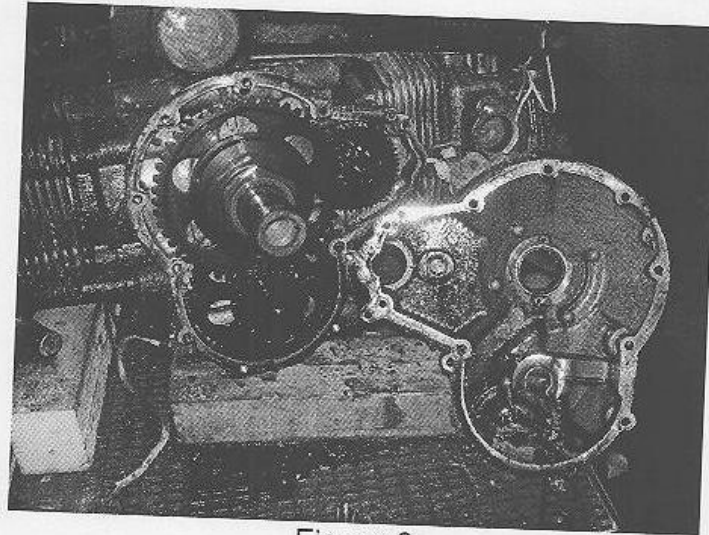


Figure 8

All valve covers was removed and no sign of mechanical failure were detected to all rocker arms, rocker arm shafts, valve push-rod assembly and valve springs. See figure 9

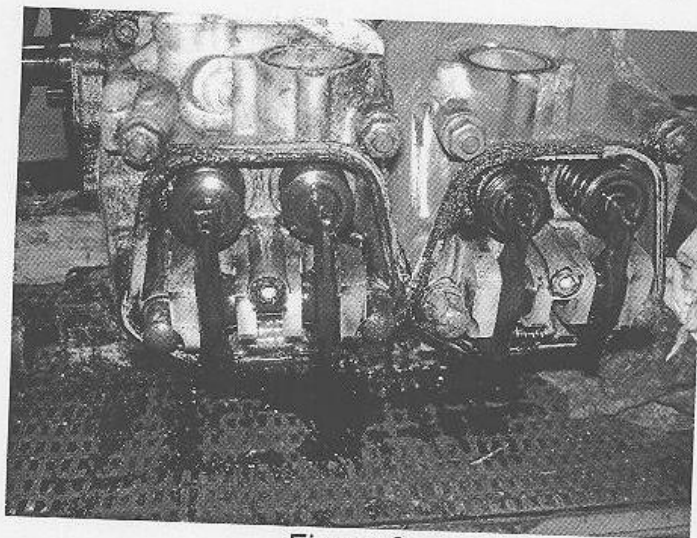


Figure 9

The gearbox was removed and it revealed no signs of any damage to the outer casing, gears, bearings, drive shafts and crank shaft drive gear. See figure 10 – 12

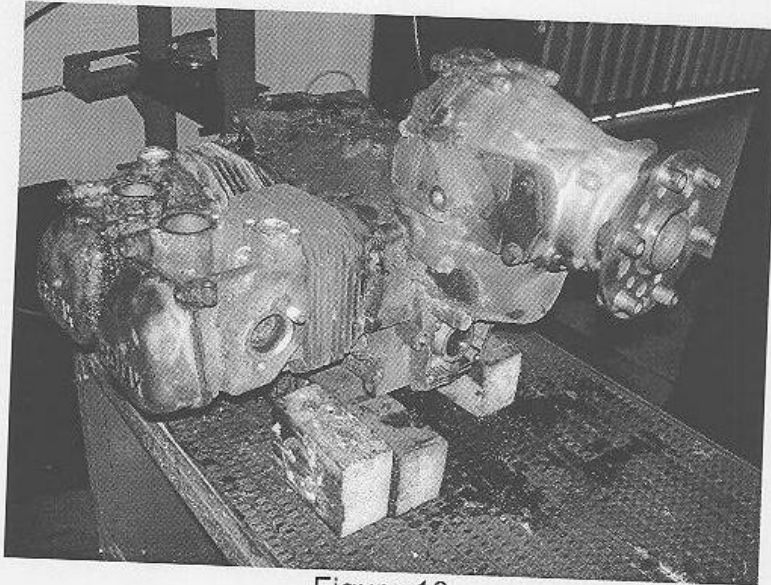


Figure 10

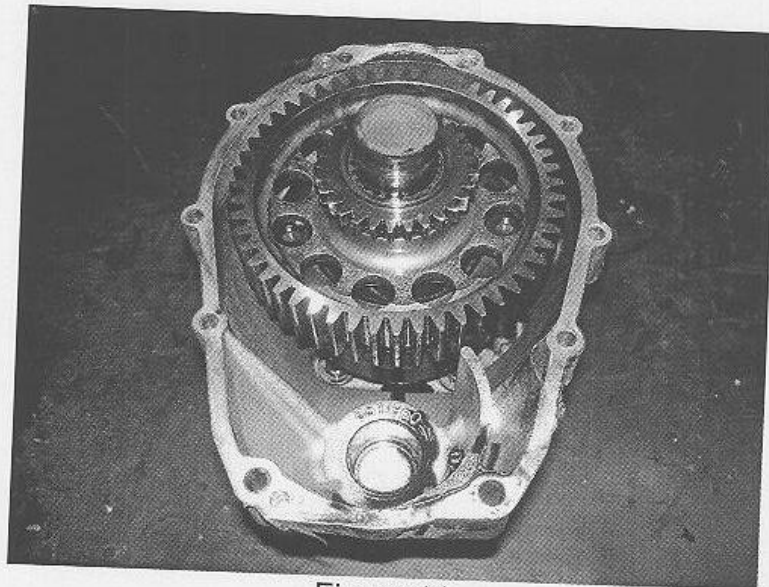


Figure 11

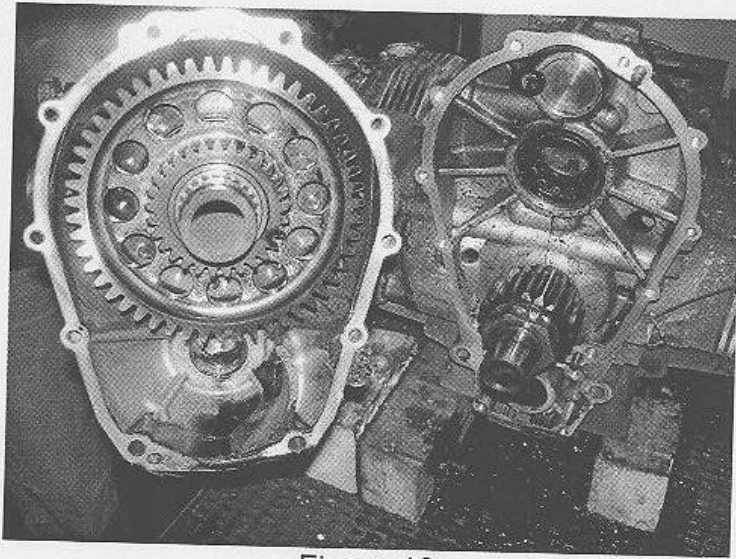


Figure 12

The gearbox was disassembled, and no damage to the gearbox components was detected. See figure 13 for the gear set assembly.

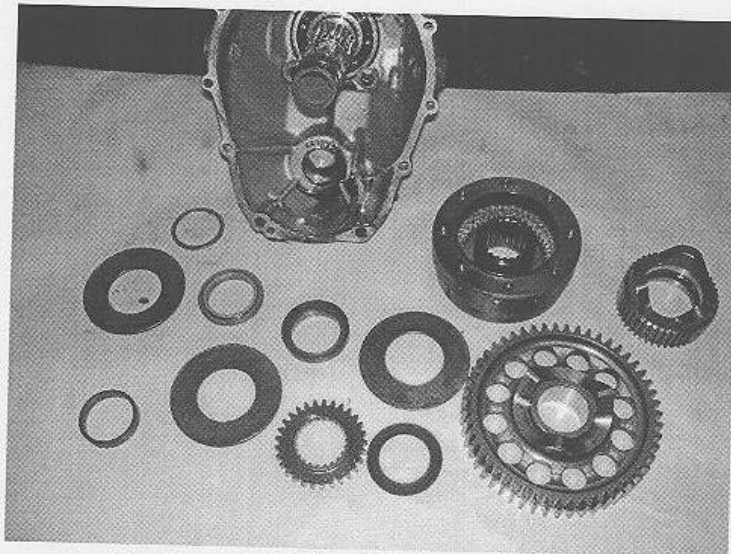


Figure 13

All four cylinder heads and sleeves were removed and no damage to the pistons, piston rings, and con-rods could be detected. See figure 14 – 15.

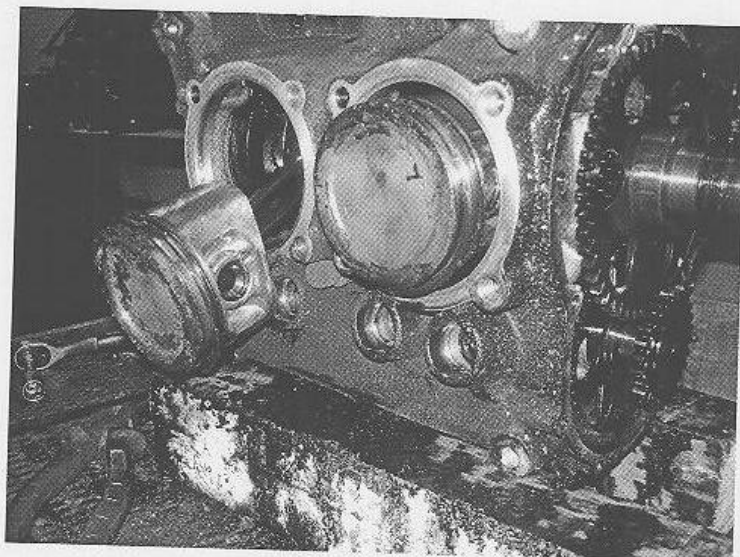


Figure 14

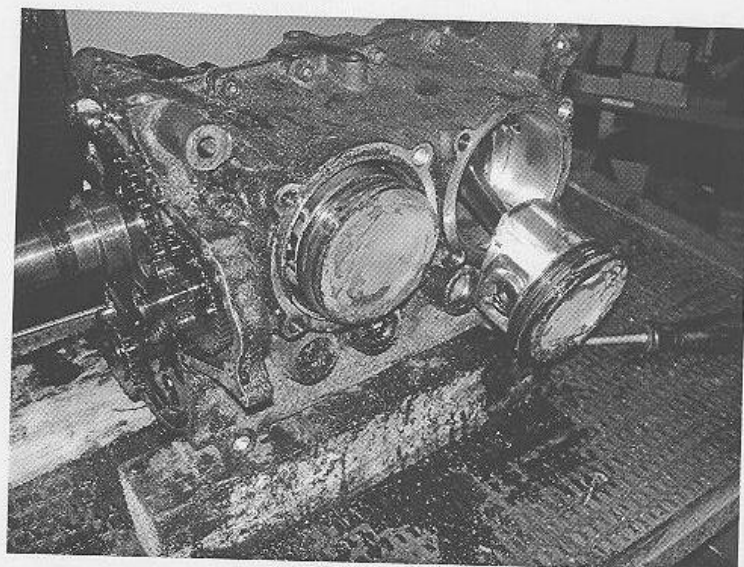


Figure 15

All four cylinders showed no signs of damage externally or internally. See figure 16 and 17.



Figure 16

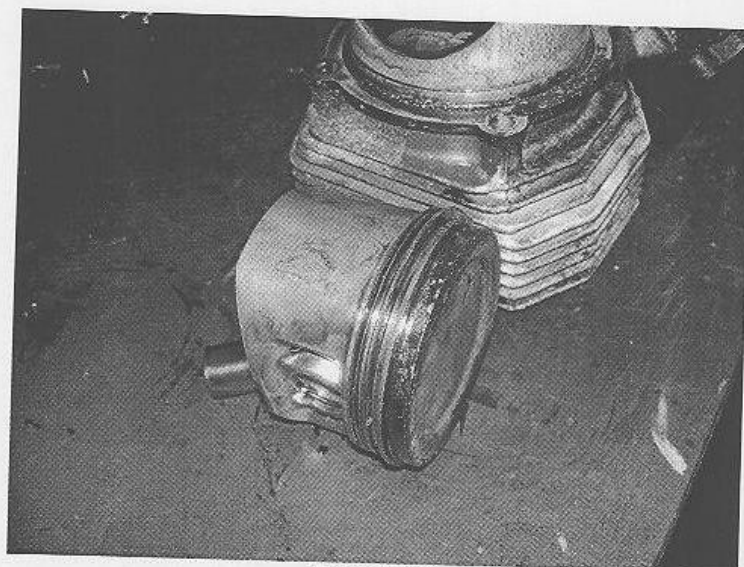


Figure 17

The oil pump was disassembled and all the internal mechanical parts were intact and no damage could be found. Figure 18 and 19 shows all the parts of the oil pump assembly.

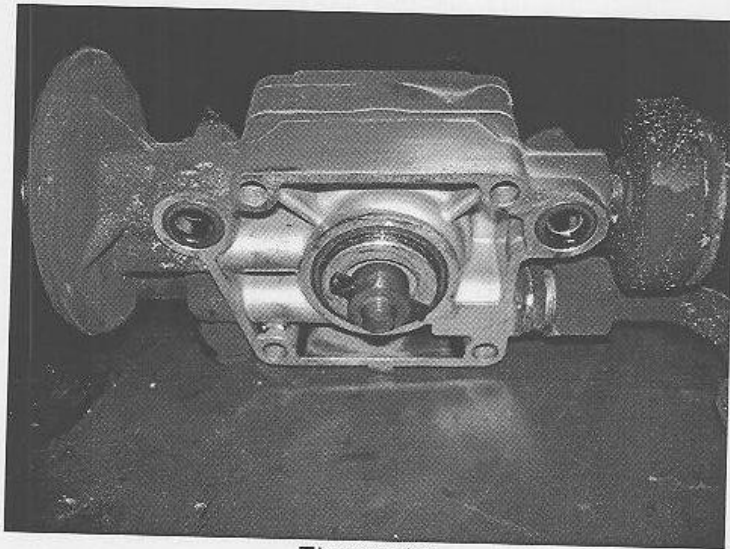


Figure 18

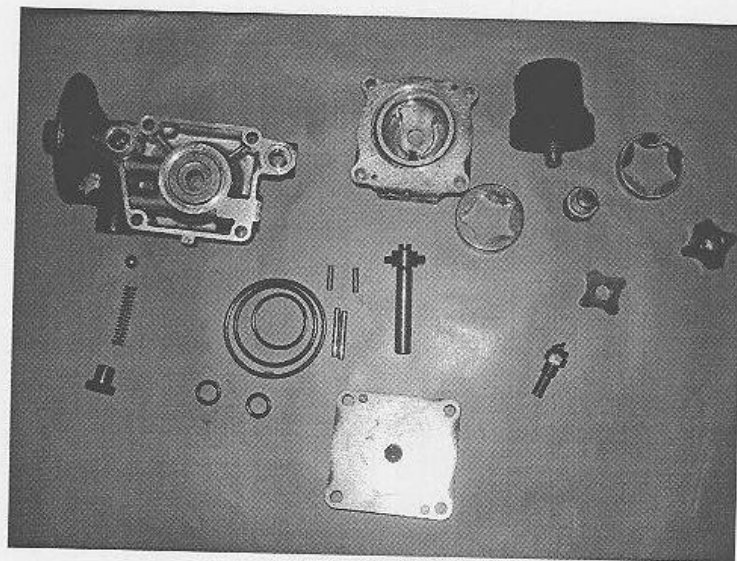


Figure 19

The exhaust system, turbo assembly and waist gate control was inspected and it revealed no signs of damage. See figure 20 and 21

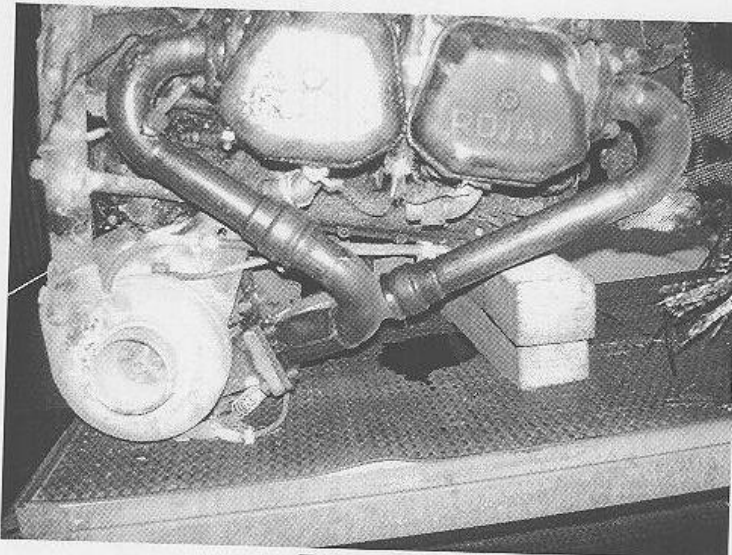


Figure 20

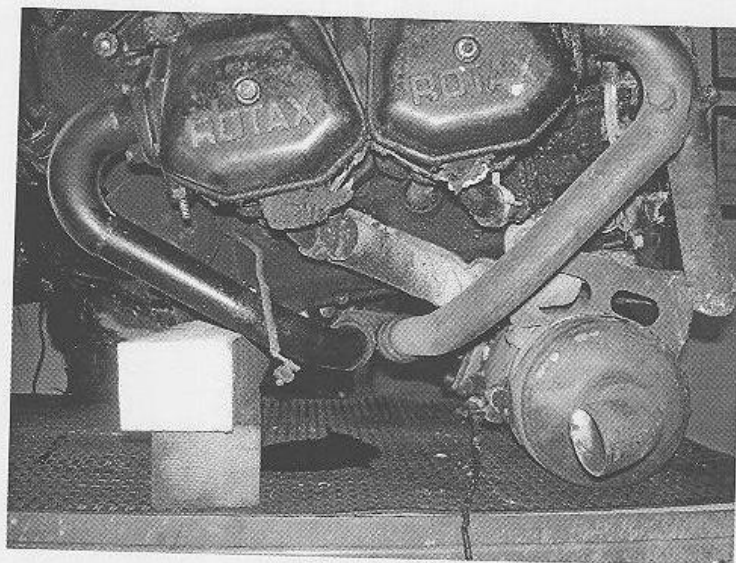


Figure 21

The two crank case halves showed no signs of cracks or damage internally or externally. All bearing services showed no signs of excessive wear. See figure 22 and 23

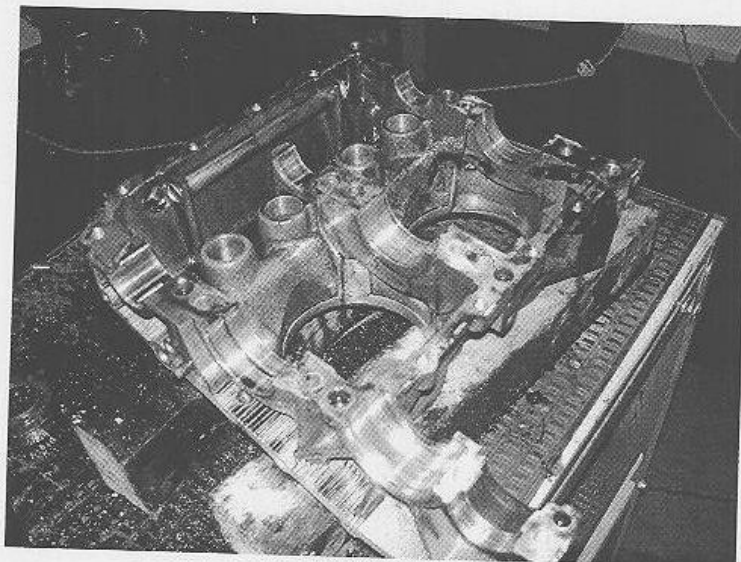


Figure 22

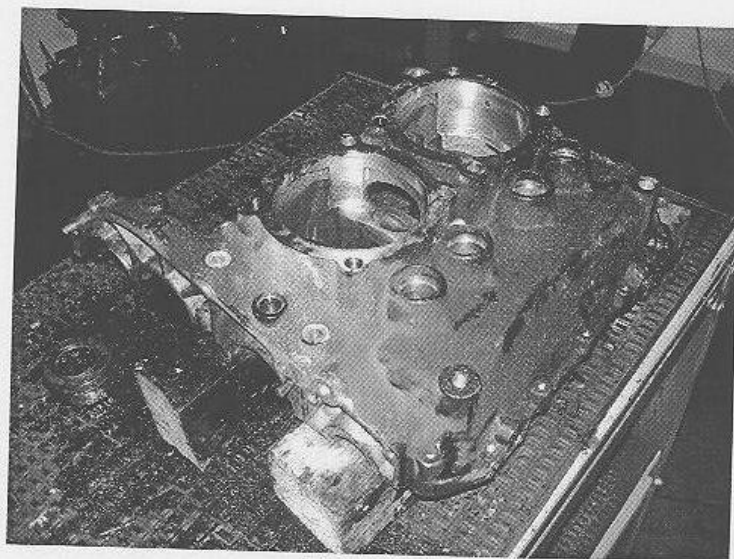


Figure 23

The camshaft showed no signs of wear on the bearing services or cam lifters. All drive gears was still in tacked. See figure 24 and 25



Figure 24

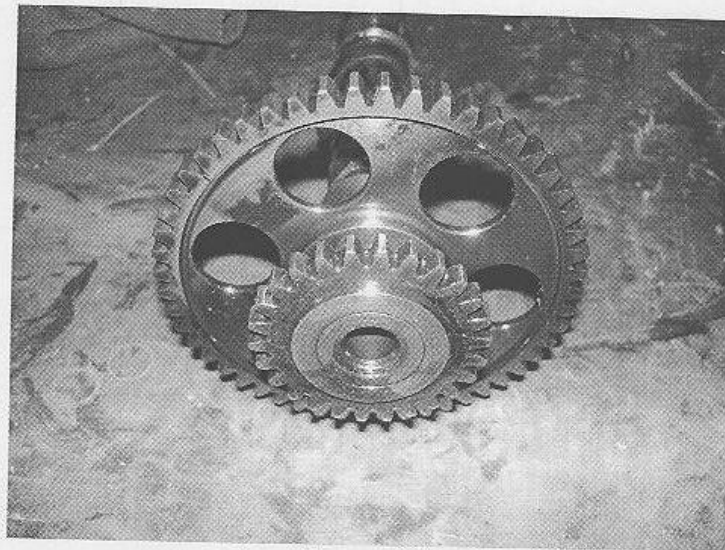


Figure 25

All the hydraulic lifters were in tacted and showed no signs of excessive wear on the camshaft mating services. See figure 26 and 27.



Figure 26



Figure 27

The crank shaft was in tacked and all bearing services showed no signs of excessive wear. The big end bearings were rotating smoothly. The con rods showed no signs of over heating or seizure at the small end bearing services. See figure 28.

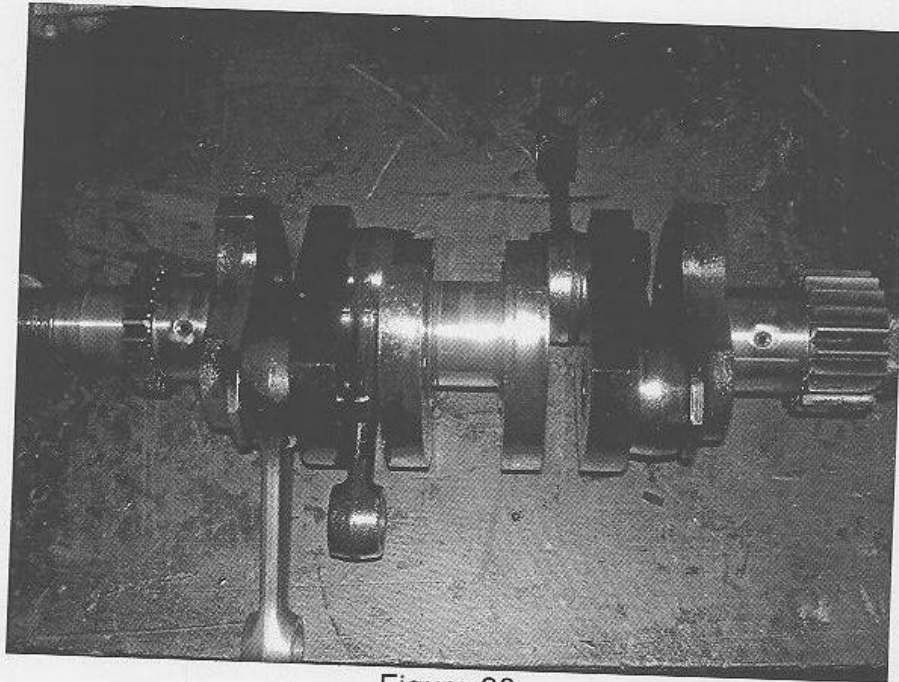


Figure 28

3. CONCLUSION

I Andre Maartens (AP No.: 185) at Air O' Craft service centre declare that I did inspect the engine to the best of my knowledge, on the 9 June 2009 in hanger 30 at Rhino park airfield with the assistance of a crash investigator of the South Africa Civil Aviation Authority and could not find any damage to all mechanical parts or components which could have led to engine failure on sudden stoppage of the Rotax engine ~~Part No.:~~ ^{Part No.:} 4419303 (S/N)

Signed: 09/06/2009

A. Maartens



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AP: 185

