

INVESTIGATION INTO FORCE LANDING INCIDENT OF
DEPARTMENT OF PLANT PROTECTION FLETCHER AIRCRAFT
AP-BAE NEAR DAHARKI ON 27-9-1983

AUTHORITY: Director General Civil Aviation Authority Memorandum
No. HQ CAA/1901/22/FS, dated 28-9-1983 (Appendix 'A')

1. AIRCRAFT INFORMATION

- | | | |
|--------|--|---|
| 1.1 | Aircraft type and
Manufacturers Serial No. | FLETCHER FU 24-950
S.No. 179 |
| 1.2 | Registration Marking | AP-BAE |
| 1.3 | Engine type, installation
and Manufacturers Serial
No. | Lycoming IO-720-AIB
Serial No. L777-54 |
| 1.4 | Propeller type | Hartzel HC-C3YR-1RF |
| 1.5 | C of R | No.528/1 (Valid) |
| 1.6 | C of A | No.480/1 valid upto 20-3-1984 |
| 1.7 | C of M | No.005/83, dated 5-9-1983
valid upto 5-10-1983. |
| 1.8 | Date of Construction
of Airframe | 21-11-1973 |
| 1.9 | Owner | Government of Pakistan
Department of Plant Protection. |
| 1.10 | Max Gross Weight
Permitted | 5430 Lbs. |
| 1.11 | Weight at the time
of accident | 3488 Lbs. |
| 1.12 | C of G | With in limits. |
| 1.13 | <u>History of Airframe:</u> | |
| 1.13.1 | Hours since new. | 480:05 |
| 1.13.2 | Hours since last
overhaul | 88:25 |
| 1.13.3 | Hours since last
periodic Inspection | 22:05 |
| 1.13.4 | Modification Status | Upto date |
| 1.13.5 | Recent History of
Airframe - Defect. | NIL |
| 1.14 | <u>History of Engine:</u> | |
| 1.14.1 | Hours since New | 954:25 |
| 1.14.2 | Hours since last
Overhaul | N/A |
| 1.14.3 | Hours since
periodic inspection | 22:05 |
| 1.14.4 | Modifications. | Upto date. |

1.14.5 Recent History of Engine defect

- i) On 23-9-1983 failure of starter to crank the engine. The defect was caused due to alternator malfunction. The alternator was replaced and aircraft became serviceable.
- ii) On 27-9-1983, High oil temperature and low oil pressure. The defect was rectified by cleaning of oil cooler externally and change of oil filter. Aircraft was given ground run and test flow, and found satisfactory.

1.15 History of Propeller

- | | | |
|--------|------------------------|------------|
| 1.15.1 | Serial No. | DY-416 |
| 1.15.2 | Time since New: | 88+25 |
| 1.15.3 | Time since O/H: | N/A |
| 1.15.4 | Time Since Inspection: | 22:05 |
| 1.15.5 | Modification status: | Upto date. |

1.16 Accessories

All with in valid life.

2. CREW INFORMATION:

2.1 Pilot in-command

- | | | |
|--------|---|-------------------------|
| 2.1.1. | Name | SYED IQBAL HASSAN RIZVI |
| 2.1.2 | Age | 40 Years. |
| 2.1.3 | Date of Joining
Department of Plant
Protection. | 17-5-1978 |
| 2.1.4 | Licence No. | C.P.L.472 |
| 2.1.5 | Type rating. | FLETCHER FU-24 |
| 2.1.6 | R.T.O. Licence | 533 |
| 2.1.7 | Medical | 2-5-1983 |
| 2.1.8 | Total Flying
Experience | 771:00 Hrs. |
| 2.1.9 | Total in Command | 469:00 Hrs. |
| 2.1.10 | Total Spray Flying
on Fletcher Aircraft | 100:00 Hrs. |
| 2.1.11 | Total Flying in
Last 90 days. | 61 Hrs. |
| 2.1.12 | Total Flying in
last 7 days. | 7 Hrs. |

(Contd.....P/3.....)

3. HISTORY OF FLIGHT

Aircraft was on spray operation at Sundh, near Daharky. The aircraft took off at 1705 on 27-9-1983. At about 1740 hrs. (35 minutes after take off), the aircraft was returning to base after completion of spray, when the pilot heard an un-usual loud grinding noise, associated with vibrations. Subsequent to that pilot decided to force land, considering the noise and vibration to be caused due to engine malfunction. The aircraft force landed safely in the desert, causing very minor damage to aircraft structure.

4. INJURY TO PERSON:

NIL

5. DAMAGE TO AIRCRAFT:

5.1 Airframe Damage.

Just before halting of the aircraft, the left wing tip hit into a bush which caused following damage:-

- a) Left wing tip (fiber glass) broken at the leading edge.
- b) Left wing leading edge, near the wing tip slightly dented, approximately 5" x 5"
- c) Left Airleron, out-board end (fiber glass) cracked.

5.2 Engine damage.

NIL

5.3 Propeller damage

NIL

5.4 Instruments damage

Stall warning system(Electrically actuated red light) became unserviceable.

5.5 Spray System damage.

The ram air operated fan, which drives the spray pump, became free on its drive shaft which resulted in cutting a groove on the pump drive shaft.

6. OTHER DAMAGE

NIL

7. METEOROLOGICAL CONDITIONS:

- a) Fair weather.
- b) Temperature 29°C.
- c) Calm Wind.
- d) Visibility 10 Km.

(Contd.....P/4.....)

8. AIDS TO NAVIGATION. ADF.
9. COMMUNICATIONS. VHF.
10. SCENE OF ACCIDENT
Plain sandy field with a few bushes and sand-dunes on the sides, approximately 7 miles east of Khinjo.
11. WITNESSES. Not applicable as the landing was made in the desert.
12. EXAMINATION OF THE WRECKAGE Aircraft survey report is attached as appendix 'B'.

13. DISCUSSION AND ANALYSIS

13.1 Cause of Grinding Noise.

To check the production of ~~grinding~~ noise as reported by the Pilot, the fan was made to rotate under ram effect during the engine ground run up, and the vibration & grinding noise experienced during this process was of considerable intensity. As such it is concluded that the reported grinding Noise and vibrations were produced due to free rotation (rubbing) of the spray pump fan on its drive shaft.

13.2 Cause of Pump Failure

Detailed examination of the failed spray pump revealed that the metallic key which holds the fan on the shaft was not installed. This resulted in free rotation of the fan which produced the grinding noise and vibrations. Following points confirm the non installation of the key.

- 13.2.1 The key once installed cannot come out of its race on its own without forward movement of the fan, which had not occurred in this case.
- 13.2.2 There is no evidence of the secondary damage which can be caused due to breaking of the ~~key~~.
- 13.2.3 The fan installed on this aircraft is slightly different from the other fans available in Department of Plant Protection. With the normal key installed, it is not possible to install the fan on the pump shaft at its existing position.
- 13.2.4 The fan is installed on the pump shaft in the field while installing the pump on the aircraft. The pump (ex-store) was installed on this aircraft^m 14-9-1983. Although the mechanic^{who} had installed the fan on the pump states (Statement attached as Appendix 'G') that he had installed the key while installing the pump, but subsequent to the incident when he was asked to install the normal key on the pump, he could not do so.

In view of the above it is concluded that the metallic key was not installed while installing the fan on the pump.

(Contd.....P/5.....)

13.3 Engine Performance

- 13.3.1 Fuel from the fuel stainer, and from all the four fuel tanks was checked for water contamination and was found clear.
- 13.3.2 Fuel vents for all the tanks were found clear.
- 13.3.3 Oil quantity was adequate and oil was free of metal particles.
- 13.3.4 No abnormality was noticed in engine performance during the engine run up. (Engine run up results are given in para 16 of appendix 'B')

The above mentioned points indicate normal operation of the engine.

14. FINDINGS

- 14.1 Mr. Amir Ali Senior Mechanic who installed the pump and aircraft engineer Azam Jah who certified the pump installation failed to properly install the spray pump fan.
- 14.2 The pilot (CPL No.472) could not properly ascertain the engine performance/malfunction at the time of force landing.
- 14.3 The pilot forgot to put the fuel selector to 'OFF' position while making emergency landing.
- 14.4 No agricultural spray rating is presently in practice which should authenticate the competence of a pilot for spray operation.
- 14.5 As per C.A.A. requirement issued vide letter No.CAA/1807/7/AVMED(CELL), dated the 14th April, 1983 (Appendix 'C'), spray pilots are required to undergo SERUM CHOLINESTRASE LEVEL test at the start of spray season and thereafter at monthly intervals. This requirement was not fulfilled. However, subsequent to this incident the pilot in command was subjected to the afore mentioned test and the report is enclosed as Appendix "F".
- 14.6 Signalling devices emergency ration and life saving equipment was ^{not} taken on board while operation above the desert.

15. CAUSE:

- 15.1 Non installation of key on the spray pump while installing the fan.
- 15.2 Incorrect judgement by the pilot in ascertaining the engine performance.

16. RECOMMENDATIONS

- 16.1 Aircraft engineer Mr. Azam Jah, AME-194 and Senior Mechanic Mr. Amir Ali of Department of Plant Protection may be warned for the discrepancy committed by them.

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- 16.2. Agricultural spray rating *may* be introduced so that only appropriate pilots perform the spray operation.
- 16.3. Serum Cholinestrastase level test of the spray pilots should be performed in accordance with the requirements laid down in C.A.A. letter No. CAA/1803/7/AVMED (CELL), dated 14-4-1983.
- 16.4. Emergency ration, life saving equipment and signalling devices should be carried on board while performing operation above desert.

17. DOCUMENTS.

- 17.1. Appendix 'A' : Authority for investigation
No.(HQ,CAA/1901/22/FS, dated 28.9.83.
- 17.2. Appendix 'B' : Aircraft Survey Report.
- 17.3. Appendix 'C' : C.A.A requirements on SERRUM
CHOLINESTRASE level Test (No.CAA/
1803/7/AVMED(CELL), dated 14-4-1983.
- 17.4. Appendix 'D' : Statement of Pilot in command.
- 17.4. Appendix 'E' : Statement of Base Aircraft Maintenance
Engineer. (Mr. Azam Jah).
- 17.5. Appendix 'F' : Serum Cholinestrastase level test report
of the pilot in command.
- 17.6. Appendix 'G' : Statement of the Mechanic who installed
the fan on the pump(Mr.Ameer Ali).

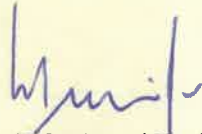
Dated: 15.12.83



(GHULAM MURTAZA)
Senior Airworthiness Surveyor,

OBSERVATIONS OF DIRECTOR GENERAL, C.A.A.

1. I have gone through the Investigation Report in respect of Fletcher type of aircraft bearing Nationality & Registration marks AP-BAE which forced landed near Dharki on the 27.9.1983.
2. I agree with the findings and recommendations made by the Investigating Officer. These be implemented immediately.



(KHURSHID ANWAR MIRZA)
Air Vice Marshal,
DIRECTOR GENERAL,
CIVIL AVIATION AUTHORITY

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بسم اللہ الرحمن الرحیم

No: HQ CAA/1901/22/FS

HQ. CIVIL AVIATION AUTHORITY
19-LIAQUAT BARRACKS,
KARACHI.

September 28, 1983.

M E M O R A N D U M

In exercise of the Power conferred by Rule 329 of the Civil Aviation Rules 1978, the following is appointed as Investigator of Incident to investigate into the Forced Landing Incident involving Department of Plant Protection Fletcher aircraft Reg. Mk. AP-BAE which occurred on 27th September, 1983 near Dharki at 1730 P.S.T.

1: Mr. Ghulam Murtaza,
Senior Airworthiness Surveyor
Airworthiness Branch,
Karachi Airport, Karachi.

Investigator-in-
Charge.

The Investigator will exercise the powers for investigation conferred by Section-4 Rules 329, 330 and 332 of Civil Aviation Rules, 1978.

Acting

(RAIS A. RAFI)
Air Commodore,
DIRECTOR GENERAL CIVIL AVIATION AUTHORITY:

✓ Mr. Ghulam Murtaza,
Senior Airworthiness Surveyor,
Airworthiness Branch,
Karachi Airport,
K a r a c h i.

Copy to:

- (1) Chief of Airworthiness,
Airworthiness Branch,
Karachi Airport,
K a r a c h i.
- (2) Chief Pilot,
Department of Plant Protection,
Hamilton Hangar,
Karachi Airport,
K a r a c h i.