

1. AIRCRAFT INFORMATION.

- 1.1 Nationality & Registration Marks : AP - AOJ
- 1.2 Aircraft type : Cessna - 320A
- 1.3 Engine type : Continental TSIO470B
- 1.4 Certificate of Registration Number : 336
- 1.5 Certificate of Airworthiness No. & date of expiry : 282/1(Rev-I) Valid till 04.10.1990
- 1.6 Certificate of Maintenance, date & time of issue with its Validity : N/A
- 1.7 Year of construction of air-craft : 1963
- 1.8 Name & address of owner : Rawalpindi Flying Club, P.O.Box No.75, Rawalpindi
- 1.9 Maximum all up weight permitted by 'C of A' for the flight and at the time of accident/incident : 2364 Kgs.
- 1.10 Loading: Centre of gravity limits permitted by 'C of A' at the time of accident/incident and commencement of flight. : Not a factor in this incident.
- 1.11 Airframe history(give flying times since manufacture; last overhaul and last periodic check. List also essential modifications completed). : 1480:05 hours since manufacture.
- 1.12 Engine history(give flying times since manufacture; last overhaul and last periodic check. List also essential modifications completed). : Not a factor in this incident.
- 1.13 Accessory history(give details of operating life and operating time since manufacture and overhaul) : Not a factor in this incident.
- 1.14 Defects (list and remark upon any technical defects in air-frame, engine(s) or accessories discovered during investigation: : Defects were found on nose landing gear. Details have been provided in Appendix-'A'

(crew)...../-2

2. CREW INFORMATION

2.1 Pilot-in-Command:

- 2.1.1 Name : Mr. Mazhar Ali Chaudhry
- 2.1.2 Type of licence along- : PPL No.614 Valid till April
-with No. & Validity : 1992
- 2.1.3 Ratings : Cessna-150/152, 180, 320 air-
-craft and permission to
carry passengers.

2.2 Co-Pilot(Observer)

- 2.2.1 Name : Mr. Waqar Aftab
- 2.2.2 Type of licence along- : CPL No.1103 Valid till
-with No. & Validity : 10.8.1991
- 2.2.3 Ratings : Cessna-150/152, 188, 180
aircraft - I.R. Valid till
28.10.1991.
F.I. on Cessna-150/152 air-
-craft.

3. SUMMARY OF ACCIDENT/INCIDENT.

Cessna-320A aircraft AP-AOJ belonging to Rawalpindi Flying Club was taken to runway for checking brakes during fast taxi on 20.6.1991 at about 1200 hours. During taxi the nose landing gear yoke broke and Islamabad runway was blocked from 1225 hours to 1252 hours. Although the aircraft did not have valid 'C of A' and 'C of M' (as a matter of fact 'C of A' was in progress) the pilot-in-command taxied the aircraft to runway 12 and reportedly carried out power check on engines and fast taxi check for checking brakes. Because of breakage of yoke there were consequential damages to air-
-craft.

4. INJURY TO PERSON(S).

None

5. DAMAGE TO AIRCRAFT.

Damage to aircraft is attached as Appendix 'A'.

6. OTHER DAMAGES.

None

7. METEOROLOGICAL CONDITION.

Not a factor in this incident.

8. NAVIGATION AND LANDING AIDS VISUAL/NON VISUAL).

Not a factor in this incident.

9. COMMUNICATION (INCLUDING RADIO COMMUNICATION).

ATC tape transcript is attached as Appendix 'B'.

10. AERODROME AND GROUND FACILITIES.

Not a factor in this incident.

11. FLIGHT RECORDERS.

N/A

12. WRECKAGE AND IMPACT INFORMATION:

Yoke of nose landing gear broke. Rubbing marks of the same were visible on the runway for about 700 ft (i.e. between 3600 ft and 4300 ft of runway 12). Because of this breakage, tips of both blades of L/H & R/H propellers rubbed against the runway and were bent rearward. Because of braking action by Pilot for controlling /stopping aircraft; R/H main wheel burst due to overheating. Nose landing gear door was also damaged by the separated nose wheel. The aircraft was immediately removed to taxi way 'Bravo', to clear the runway, by PAF authorities.

13. FIRE

None

14. SURVIVAL ASPECTS

Both the crew members were able to come out of the aircraft through normal entry / exit door.

15. TEST AND RESEARCH.

Broken parts were examined and the nose wheel was dismantled to examine axle and other related parts.

16. OBSERVATIONS

- 16.1 Aircraft should not have been taken to the runway as it was still undergoing 'C of A' work and it did not hold valid 'C of A' & 'C of M'. This incident resulted in blocking of runway for about 27 minutes.
- 16.2 The aircraft being maintained/operated by Rawalpindi Flying Club are exposed to vagaries of weather because Rawalpindi Flying Club does not possess hangar for housing and maintenance/repair of aircraft.
- 16.3 The result of test and research indicated lack of maintenance as nose wheel bearing was found to be corroded and partially seized.

17. INVESTIGATION

- 17.1 As already mentioned aircraft did not hold valid 'C of A' and 'C of M', therefore it should not have been taken to the runway under any circumstances. This incident resulted in blocking of runway which is very serious and could have caused complications in smooth operation.
- 17.2 'Axle bolt bucket' had to be removed with lot of force and 'spacer' was found damaged. Pieces of mounting holes of the yoke were found pressed to the 'axle bolt bucket' fixed to the mud guard and scraper assembly attachment points. Signs of overheating were noticed on these pieces. Examination of parts revealed extensive corrosion on 'axle tube' under 'bearing cup'. 'Bearing cone' was also found to be corroded. Moreover, bearing was found to be dry (i.e. lack of grease) and partially seized. Signs of overheating were also noticeable. Detailed damaged report is attached as Appendix 'A'.
- 17.3 Since bearing was corroded, lacked lubrication and was partially seized the left 'mounting hole' of the yoke broke during turning/taxi. This resulted in damage to rim of 'Male wheel half' by R/H side of the yoke and 'mounting hole' of the yoke on R/H side also broke. This caused separation of 'Nose wheel and tyre assembly' from the yoke.

The broken yoke caused rubbing marks on the runway as it scraped the same. The 'wheel and tyre assembly' hit the nose landing gear door and caused dents on the door. Since the yoke of aircraft touched runway the height of aircraft was reduced and resulted in rubbing of tips of both blades of L/H & R/H propellers on the runway. Since engines were running this caused backward bend on the tips of blades. Due to excessive braking to control and stop the aircraft, R/H main wheel was overheated and resulted in tyre burst on this wheel.

- 17.4 Investigation clearly established lack of servicing/maintenance on "Nose wheel and tyre assembly". It would be worth mentioning here that the wear on Nose wheel tyre was uneven. It was less in the centre and more on both sides. Cut on the nose wheel tyre and tube was due to impact with the nose landing gear door.
- 17.5 Contributory factor to this incident is exposure of aircraft to vagaries of weather since Rawalpindi Flying Club does not possess hangar for housing and maintenance/repair of aircraft.

18. WITNESSES

Statement of Pilot-in-Command, observer on board and AME-790 are attached as Appendix 'C', 'D' & 'E' respectively.

19. DISCUSSION OF EVIDENCE

Witnesses statements corroborate with the investigation except for statement of the AME. AME claims to have serviced nose 'wheel and tyre assembly' about 2 months back. This could not be substantiated with the result of dismantling observed by us because grease was lacking and corrosion was noticed. What ever grease we found in the bearing was black and even some sand particles were found inside the "wheel and tyre assembly".

20/21 FINDINGS/CAUSE(S).

- (a) Violation of laid down requirements by Pilot-in-command as he had taken an unserviceable aircraft to runway for taxi check.
- (b) Nose wheel bearing was corroded, lacked lubrication and was partially seized.
- (c) Exposure of aircraft to vagaries of weather since Rawalpindi Flying Club does not possess hangar for housing and maintenance/repair of aircraft.

22. RECOMMENDATION(S)

- (a) Appropriate disciplinary action should be taken against Pilot-in-command for taxiing an unserviceable aircraft to runway and causing blockage of the same due to breakage of nose landing gear yoke.
- (b) Appropriate disciplinary action should be taken against AME 790 for lack of maintenance of nose 'wheel and tyre assembly'.
- (c) Rawalpindi Flying Club should be advised to arrange hangar facilities immediately in accordance with this office letter No. CAW/4790/19/Org, dated 30.5.1991. In case they fail to comply; organisation approval granted to them should not be renewed when it falls due next.

DAMAGE REPORT OF CESSNA-320 AIRCRAFT
AP-AOJ OF RAWALPINDI FLYING CLUB

- 1) Tip of both blades of L/H & R/H propellers found rubbed and bent rear-ward.
- 2) R/H main landing gear tyre found burst.
- 3) Dent on doors of nose landing gear.
- 4) Details of damage to nose landing gear:-
 - a) Rubbing marks on L/H and top rod of 'mud guard and scraper assembly'.
 - b) Dents on 'mud guard and scraper assembly'.
 - c) L/H eye bolt of 'mud guard and scraper assembly' was found to be loose.
 - d) Dust covers were found missing.
 - e) Cuts on the tyre.
 - f) Tube was found to have very long cut circumferentially.
 - g) Male wheel half found to be damaged near its rim.
 - h) Uneven wear of the tyre (less wear in the centre and more wear on both sides).
 - i) After removal of cotter pin, nut and bolt the axle bolt bucket could not be removed easily. Lot of force had to be used to remove the axle bolt bucket.
 - j) 'Bearing cone' was found to be extensively corroded and seized due to lack of lubrication and signs of overheating were noticed.
 - k) 'Axle tube' was found to be corroded under bearing cup.
 - l) Mounting holes in yoke separated from the yoke and were found in pieces. Signs of overheating were also noticed on pieces of these holes.
 - m) 'Spacers' were found to be damaged.
 - n) Pieces of mounting holes of yoke were found pressed to the axle bolt buckets.



AIRCRAFT PARKED ON TAXIWAY 'BRAVO'



MUD GUARD AND SCRAPER ASSEMBLY. PIECES OF MOUNTING
HOLES OF YOKE ARE FIXED TO ITS ATTACHEMENTS POINTS.



NOSE WHEEL. SPACER DAMAGE IS INDICATED (LEFT SIDE)



CUT ON THE TYRE OF NOSE WHEEL.