FINAL INVESTIGATION REPORT OF SERIOUS INCIDENT TO HARYANA INSTITUTE OF CIVIL AVIATION CESSNA 152 AIRCRAFT VT-EMT AT PINJORE ON 03.11.2012

GOVT OF INDIA
CIVIL AVIATION DEPARTMENT
O/O DIRECTOR AIR SAFETY
NORTHERN REGION
SAFDARJUNG AIRPORT
NEW DELHI-03

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General Information:

a)	Aircraft	Type	: Cessna
		Model	: 152
		Nationality	: Indian
		Registration	: VT-EMT
	Engine	Type	: Lycoming O-235-N2C
b)	Owner		: Aeroclub of India
c)	Operator		: Haryana Institute of Civil Aviation Pinjore, Haryana
d)	Pilot in command		: Student Pilot License
	Extent of Injuries		: Nil
e)	No. of Passengers		: Nil
	Extent of Injuries		: Nil
f)	Geographical Location of Incident Site		: Lat N-30° 49’ 35”
			: Long E- 76°52’ 57”
g)	Date and time of incident		: 03.11.2012, 0720 UTC
h)	Last Point of Departure		: Pinjore Airfield
i)	Point of Intended Landing		: Pinjore Airfield
j)	Phase of operation		: Landing
k)	Type of Incident		: Bounced landing

(All timings in the report are in UTC unless otherwise specified)

Synopsis

Cessna-152 aircraft VT-EMT belonging to Haryana Institute of Civil Aviation (HICA) while engaged in a solo training flight (Circuit and landing) under the command of Student Pilot was involved in a bounced landing incident at Pinjore Airfield on 3.11.2012.

The student pilot was released by the CFI to carry out check for solo circuit and landing exercise(Total- 4 Circuit and landings). After carrying out all the checks and informing on R/T to CFI, he was cleared for line up on R/W 34. Aircraft took off from R/W 34 for Right Hand Landing Circuit. It was the first circuit/landing of the student pilot and the performance of the aircraft was reported normal after take-off. Thereafter he reported downwind & finals for R/W 34 and was maintaining approach speed of appx. 65 Kts. The student pilot have stated that, after giving first check, aircraft was flying parallel to the runway but instantly he experienced a sudden updraft and down draft. As a corrective action Student Pilot had initiated a Go Around by applying full power and forward pressure on the stick but the aircraft hit the runway which resulted in collapsing of nose gear and damage to the propeller. Thereafter, aircraft stopped on the runway and trainee pilot came out from the aircraft by himself.

There was no injury to the student pilot and there was no fire. The visibility was reported fine with moderate winds and turbulence. The incident occurred during day time.

1.0 Factual Information:

1.1 History of Flight:

Cessna-152 aircraft VT-EMT belonging to Haryana Institute of Civil Aviation (HICA), was engaged in a solo training flight (Circuit and landing) under the command of Student Pilot at Pinjore Airfield on 3.11.2012.

On 3.11.2012 Student Pilot reported to the flying club for flying at 0230 UTC. At that time Cessna-152 aircraft VT-EMT was undergoing 25 hours maintenance schedule and was released by the AME at 0445 UTC and Certificate of release to service (CRS) was issued at 0500 UTC. Before releasing the aircraft for flying, engine was given ground run by the AME which was found satisfactory. All the flying controls checked for full and free movement including brakes and found to be satisfactory. Total fuel at the time of departure was 140 litres. Initially, trainee pilot was planned for the cross country flight overflying Amritsar and back but could not do so due no contact with Delhi FIC. At 0700 UTC student pilot was released by the CFI to carry out check for solo circuit and landing exercise (Total- 4 Circuit

and landings). After carrying out all the checks and informing on R/T, he was cleared for line up on R/W 34 at 0710 UTC.

Fig.1 Showing aircraft final position veering to the left with nose under carriage collapsed.

Aircraft took off from R/W 34 for Right Hand Landing Circuit. This was the first circuit for the student pilot and for the aircraft for that day. During take-off the performance of the aircraft was reported normal by the student pilot. Thereafter he reported on downwind & finals for R/W 34 and was maintaining approach speed of approx 65 Kts. After giving first check, aircraft was flying parallel with the runway (appx. 8 feet height). The student pilot mentioned that, he experienced a sudden updraft and down draft. As a corrective action Student Pilot had initiated a Go Around by applying full power and forward pressure on the stick (nose down) but the aircraft hit the runway which resulted in collapsing of nose gear and damage to the propeller. After the aircraft stopped on the runway and trainee pilot evacuated the aircraft himself. Fire vehicle reached the aircraft and also rescued the trainee pilot and escorted him away from the incident site. There was no injury to the student pilot and there was no fire. The visibility was reported fine with moderate winds and turbulence. The incident occurred during day time at 0720 UTC.

As per the API the trainee pilot was carrying out solo flying for circuit and landing exercise. During landing he was not able to control the aircraft and nose of the aircraft hit the runway.

1.2 Injuries to Persons:

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor	Nil	Nil	Nil
None	1	Nil	Nil

1.3 Damage to Aircraft: Substantial.

1. Both the Propeller blades damaged.
2. Engine mount damaged.
3. Nose undercarriage damaged.
4. Main undercarriage axles bent.
5. Firewall dented.

Fig.2 Showing both the propeller blades bent

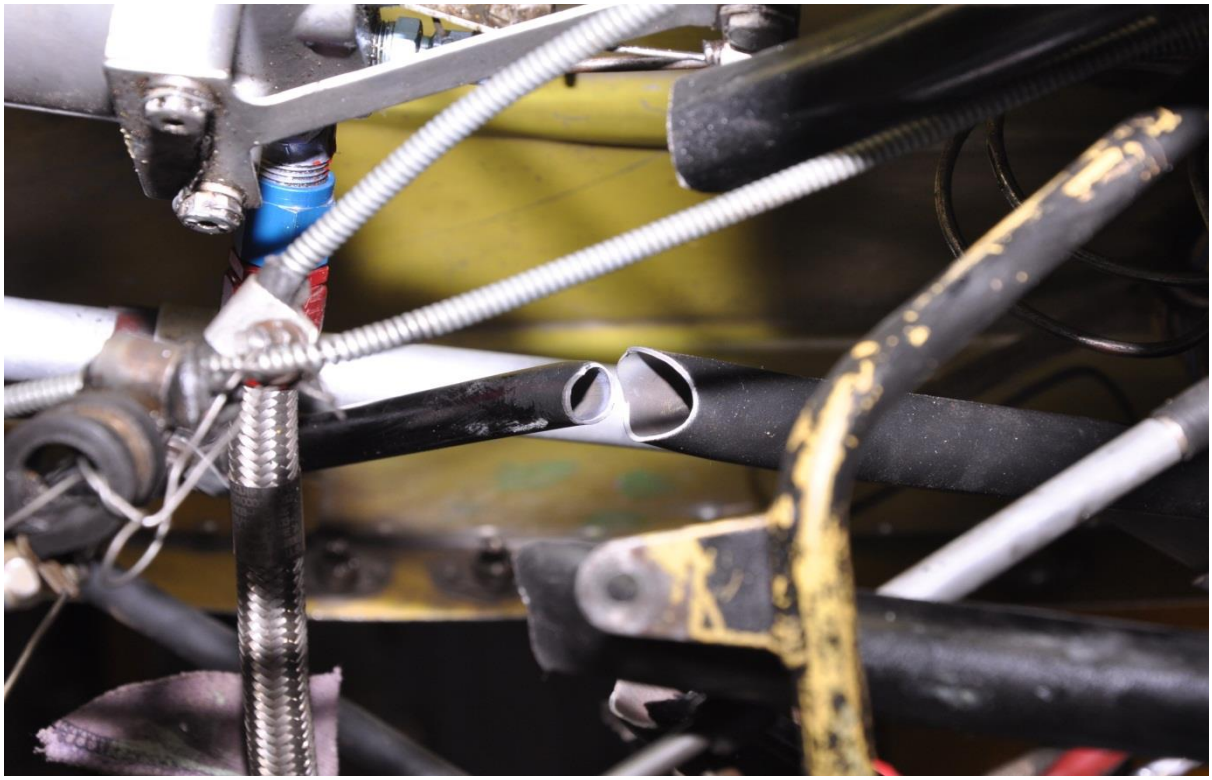

Fig.3 Showing Engine mount damaged.

1.4 Other Damage: Nil

1.5 Personnel Information:

1.5.1Pilot in command:

Age	: 28 Years
Licence Type and issue	: SPL Issued on 14.10.2006
Validity	: 25.4.2017
Endorsements	: Single Engine land- Cessna 152
Medical Validity (Class I & II)	: Class I- Valid till 28.2.2013
Flight Radio Telephone operator's Lic	: Issued on 19.5.2009, valid till 18.5.2014
Total flying experience	: 103:55 Hrs
Experience on type	: 103:55 Hrs
Flying Experience last one year	: 11:55 Hrs
Flying Experience last 30 days	: 11:55 Hrs
Flying Experience last 7 days	: 02:45 Hrs
Flying Experience last 24 hours	: 02:45 Hrs

Student pilot started his flying at Chetak Aviation, Aligarh, UP and did his first dual sortie on 7.3.2011. He was cleared for his first solo flight after 14:10 hrs of dual flying on 20.4.2011 which was found satisfactory. He continued his flying at Chetak Aviation till 12.10.2011 and had total flown for 91:50 hrs. After Chetak Aviation operations stopped at Aligarh, he joined Haryana Institute of Civil Aviation, Pinjore, Haryana in July 2012 and

started flying from 12.10.2012 with a dual sortie of 30 minutes with CFI wherein local circuit and landing practice was given. A day prior to incident on 2.11.2012 student pilot had carried out solo cross country flight. As the student pilot had not flown for one year there is no evidence that he was given recency flying training by CFI before commencing his flying at Pinjore.

1.6 Aircraft Information:

Cessna-152 aircraft VT-EMT bearing aircraft serial No. 1520399 was manufactured in year 1986 by Cessna aircraft company, USA. The aircraft was issued Certificate of Airworthiness by DGCA India on 9.10.1986. The C of A was issued in Aerobatic category and Passenger sub category. The aircraft has seating capacity of two and has Maximum All Up Weight of 760 Kgs. The C of A was last renewed on 5.7.2012 and was valid till 4.7.2013. The last Airworthiness Review Certificate (ARC) issued on 5.7.2012 which was valid at the time of incident. Aircraft had done 16026:25 hours since new. The aircraft had done 173:45 hrs since last ARC till the time of incident. The aircraft is fitted with one piston Lycoming engine model no. O-235 N2C engine bearing S/No. 24166-15 had done total of 7360:35 hrs since new and 174:25 hrs since last engine overhaul. The engine is fitted with two blade fixed pitch McCauley propeller.

Last 100 hrs airframe inspection was carried on this aircraft at 15931:35 hrs and since then the aircraft has flown 33 hrs till the time of incident. Aircraft had undergone 25 hours inspection schedule on 3.11.2012 at 16026 Airframe hours and found satisfactory. The weight of the aircraft at the time of take-off was 687 Kgs which included 112 Kg of fuel. There was no snag reported by the pilot on the aircraft and no snag was pending for rectification. No DGCA mandatory modification was pending on this aircraft at the time of incident.

The Cessna-152 airframe is an all-metal construction. It is primarily aluminium 2024-T3 alloy, although some components such as wing tips and fairings are made from glass-reinforced plastic. The fuselage is a semi-monocoque structure: it has vertical bulkheads and frames joined by longerons which run the length of the fuselage. The metal skin of the aircraft is riveted, which allows loads to be spread out over the structure.

1.7 Meteorological Information:

There is no Met facility available at Pinjore Airfield. The weather details are taken for every half an hour from Chandigarh Airport every day by the flying club. The weather information of the day of incident is as under:

Time 1200 hrs (0630 UTC)

Winds- 190/03 Kts, Visibility- 5000 meters, Haze, SKC Temp-27, QNH-1014 NO SIG.

Time 1230 hrs (0700 UTC)

Winds- 240/03 Kts, Visibility- 5000 meters, Haze, SKC Temp-27, QNH-1014 NO SIG.

Time 1300 hrs (0730 UTC)

Winds- 240/03 Kts, Visibility- 5000 meters, Haze, SKC Temp-28, QNH-1014 NO SIG.

As per the trainee pilot before landing winds were moderate (right cross winds, 060/08 kts as per wind sock) and favourable for R/W 34. Visibility was more than 5 Kms, temperature was more than 28° C and turbulence was moderate. Wind sock is located on the intersection of runway with the apron. Though the student had mentioned that he experienced sudden updraft/ downdraft, however with the evidence available there was no unusual weather phenomena reported on that day.

1.8 Aids to Navigation:

Not applicable.

1.9 Communications:

The flying club has a VHF set which operates on frequency 122.5 Mhz and is used by the trainee pilots for communicating from the flying aircraft with the ground during local flying of aircraft. At the time of incident aircraft was having two way communication with flying club.

1.10 Aerodrome Information:

Pinjore Airfield is an uncontrolled airfield. It is situated at an elevation of 1760 feet with coordinates of Lat 030 Deg 49’ 35” N and Long 076 deg 52’ 57” E. It has only one runway 34/16 with a total length of 3000 feet and has width of 75 feet. No landing aid is available at the airfield. Nearest VOR is Chandigarh VOR CHG 116.5 MHz, Pinjore Airfield is on the radial of 030 and 10 DME from the CHG VOR.

1.11 Flight Recorders:

Neither required nor fitted.

1.12 Wreckage and Impact Information:

The aircraft approached from R/W 34. The aircraft first came in contact with the runway surface at about 400 feet from beginning of R/W 34 with the propeller blade marks after its nose gear collapsing. Thereafter the engine cowl marks were present which continued upto 684 feet of R/W. The aircraft finally stopped at 684 feet from the beginning of R/W 34. Aircraft dragged around 250 feet on the runway before coming to final halt. The flap lever was found at 20° position in the cockpit. The rubbing marks were found towards the left of centreline of the runway indicating that during final approach the aircraft was not aligned with the runway.

Fig.4 Showing deep cut due propeller blade strike on the runway

Fig.5 Showing engine cowl grazing marks present on the left of the centreline of runway

1.13 Medical and Pathological Information:

There was no injury to the trainee pilot and no injury to any person on ground.

1.14 Fire:

There was no fire.

1.15 Survival Aspects:

The incident was survivable.

1.16 Tests and Research:

Not applicable.

1.17 Organizational and Management Information:

The flying club belong to Govt. of Haryana and it started its operations in Pinjore in September 1983. It provides flying and ground training to students for issuance of license for PPL, CPL, AFIR and FIR At present the flying club has following setup:

Number of Aircrafts : 03 (Cessna- 172- 2, Cessna-152-1)
Number of students : 10
Number of Instructors : 02 (CFI-1, API-1)
Number of AME's : 01
Number of Technicians : 03

1.18 Additional Information:

Bounced landing phenomenon:

The bounced landing is the result of trying to land with too much airspeed, then levelling too low, followed by jerking the control stick or yoke back. The airplane contacts the runway and bounces back into the air, at which time the inexperienced pilot will relax the control pressure allowing the airplane to contact the runway again. The pilot then applies backpressure, causing the airplane to bounce back in the air. Without the proper recovery technique, the bouncer landing will usually conclude with a hard landing when the excess airspeed is finally dissipated, and sometimes followed by loss of directional control.

1.19 Useful or Effective Investigation Techniques:

Not applicable.

2.0 Analysis:

The factors which generally contributed to the incident are analysed in the following para:

2.1 Operations Aspects:

On the day of incident student pilot was released by the CFI to carry out check for solo circuit and landing exercise (Total 4 circuit and landings). After carrying out all the checks he was cleared for line up on R/W 34. Aircraft took off from R/W 34 for Right Hand Landing Circuit. It was the first circuit of the student pilot. After take off the performance of the aircraft was reported normal. Thereafter he reported on downwind & finals for R/W 34 and was maintaining approach speed of approx 65 Kts. After giving first check, aircraft was flying parallel with runway (appx. 8 feet height) but instantly he experienced a sudden updraft and down draft. As a corrective action Student Pilot had initiated a Go Around by applying full power and forward pressure on the stick but the aircraft hit the runway which resulted in collapsing of nose gear and damage to the propeller. He has also stated that at the time of incident turbulence and cross winds were existing (060/08 kts as observed from windsock). Aircraft was not aligned with the runway while approaching runway for landing. At the time of flaring the aircraft bounced twice and he tried to go around but it was the late reaction from him which lead to nose hitting the runway. As per the API the trainee pilot was carrying out solo flying for circuit and landing exercise. During landing he was not able to control the aircraft and nose of the aircraft hit the runway.

2.2 Weather Aspect:

The sudden updraft and downdraft experienced by the student pilot could not be verified. Hence weather is not considered a factor to the incident.

Scrutiny of records indicates that the Student pilot started his flying in Chetak Aviation, Aligarh, UP and did his first dual sortie on 7.3.2011 and continued his flying till 12.10.2011 and had flown 91:50 hrs. After Chetak Aviation operations stopped at Aligarh, he joined Haryana Institute of Civil Aviation, Pinjore, Haryana and started flying from 12.10.2012 with a dual sortie of 30 minutes with CFI wherein local circuit and landing practice was given. As the student pilot did not fly for one year there is no evidence that he was given recency training by CFI before commencing his flying as per the DGCA Ops circular 2 of 2004. As per the said circular the pilot will undergo ground refresher on technical/performance with qualified AME/examiner on type and examiner will make an endorsement to this effect in

Pilot's log book and thereafter the pilot will undergo familiarization flight by Day or night of duration not less than 45 mts with DGCA approved examiner on type.

From the above it evident that pilot handling is the contributory factor to the incident.

2.2 Maintenance Factor:

The aircraft VT-EMT had valid C of A and the CRS was valid. The Last 100 hrs airframe inspection was carried on 9.10.2012 at 15931:35 hrs and since then the aircraft has flown 33 hrs till the time of incident. The weight of the aircraft at the time of take-off was 687 Kgs which included 112 Kg of fuel against the MAUW of 760 Kgs.

Aircraft VT-EMT had done 16026:25 hours since new. The aircraft had done 173:45 hrs since last ARC (5.7.2012) till the time of incident. Aircraft after its last ARC had flown 173:45 hrs till the time of incident. The aircraft is fitted with single piston Lycoming engine model no. O-235 N2C engine bearing S/No. 24166-15 which had done total of 7360:35 hrs since new and 174:25 hrs since last engine overhaul. Last 25 hours inspection was carried out on the day of incident which was found satisfactory. Before releasing the aircraft for flying engine was given ground run by the AME which was found satisfactory. There was no snag reported by the pilot on the aircraft and no snag was pending for rectification before the incident. Also no DGCA mandatory modification was due on this aircraft at the time of incident.

So the serviceability of aircraft is not an issue and therefore the maintenance factor can be ruled out in the incident.

2.3 Circumstances which lead to Incident:

The aircraft was serviceable and no defect was reported on the aircraft by the pilot prior or after the incident. The incident flight was the first flight of the day. At the time of incident weather was fine (winds 060/08 kts as observed by pilot from windsock). The pilot when approached the runway for landing was not aligned with runway centreline and did not give proper check (flare) before touch down. This has resulted in aircraft floating on the runway and then landed on its nose with the propeller blades striking the runway surface and bounced again. The nose gear collapsed. The pilot tried to carryout go around by applying full power and forward pressure on the stick however aircraft impacted its engine cowl with the runway surface and dragged on the runway and stopped. Ground marks indicates that when the aircraft first contacted runway surface on its nose with propeller blades contacting the runway the full power on the engine was not applied by the pilot and he relaxed on the stick as it

travelled small distance in air and then touches on its engine bottom cowling and finally came to halt. Hence the Pilot late reaction after bounce and improper technique to recover from the bounce during go around cannot be ruled out. During the incident there was no injury to the pilot and there was no fire.

3.0 Conclusion:

3.1 Findings:

1. The aircraft had a valid C of A at the time of incident.
2. There was no snag reported on the aircraft in the snag register.
3. The aircraft was given ground run by the appropriately licensed AME before releasing for the flying and its performance was found satisfactory.
4. Student pilot had a valid license to fly the aircraft and his medical was also valid at the time of incident.
5. This was the first flight of the day for the aircraft and for the student pilot on the day of incident.
6. Student pilot did not fly for one year there is no evidence that he was given recency training by CFI before commencing his flying as per the DGCA Ops circular 2 of 2004. The incident flight was his ninth sortie when he resumes flying after a gap of one year.
7. On the day of incident the student pilot was authorized by CFI to carry out (4) solo circuit and landing exercise.
8. At the time of incident weather was reported fine with winds 060/08 kts as observed from windsock by the pilot.
9. The performance of the aircraft was reported normal by the student pilot during the circuit flying and was carrying out the right hand circuit for R/W 34.
10. Student pilot when approached the runway 34 for landing did not give proper check before touch down which resulted in propeller blades contacting the runway surface due collapsing of nose gear.
11. Subsequently pilot tried to carryout go around by applying full power and forward pressure on the stick however aircraft impacted its engine cowl due collapsed nose gear with the runway surface and dragged on the runway and stopped.
12. Ground marks indicates that when the aircraft first contacted runway surface on its nose with propeller blades contacting the runway the full power on the engine was not applied by the pilot and he relaxed on the stick as it travelled small distance in air and then touches on its engine bottom cowling and finally came to halt.
13. Pilot late reaction after bounce and improper technique to recover from the bounce by carrying out go around cannot be ruled out.

3.2 Probable Cause of the Serious Incident:

Student pilot improper flare during landing made the aircraft bounce and his improper bounce recovery technique to recover from the bounced landing resulted into the incident.

4.0 Safety Recommendations:

1. As the incident occurred due to improper landing technique by the student pilot therefore suitable corrective training be imparted to him before releasing him for flying.
2. CFI to be cautioned for not carrying out the recency check of the student pilot who had one year of break in flying.

(M.J.Singh)

Date: 23.06.2014 Inquiry Officer