

AA2017-6

**AIRCRAFT ACCIDENT
INVESTIGATION REPORT**

**PRIVATELY OWNED
JA 3357**

September 28, 2017



The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board and with Annex 13 to the Convention on International Civil Aviation is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

Kazuhiro Nakahashi

Chairman

Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

AIRCRAFT ACCIDENT INVESTIGATION REPORT

AIRCRAFT DAMAGE AT LANDING A PRIVATELY OWNED BEEHCRAFT 35-C33A JA3357 AT OSHIMA AIRPORT AT ABOUT 11:00 JST, FEBRUARY 11, 2017

September 8, 2017

Adopted by the Japan Transport Safety Board

Chairman	Kazuhiro Nakahashi
Member	Toru Miyashita
Member	Toshiyuki Ishikawa
Member	Yuichi Marui
Member	Keiji Tanaka
Member	Miwa Nakanishi

1. PROCESS AND PROGRESS OF THE INVESTIGATION


1.1 Summary of the Accident	On Saturday, February 11, 2017, a privately owned Beechcraft 35-C33A, registered JA3357, suffered a damage to the aircraft, because a landing gear was retracted during a landing roll.
1.2 Outline of the Accident Investigation	<p>On February 14, 2017, upon receiving the report of the accident, the Japan Transport Safety Board designated an investigator-in-charge and two investigators to investigate this accident.</p> <p>An accredited representative of the United States of America, as the State of Design and Manufacture of the Aircraft involved in the accident, participated in the investigation.</p> <p>Comments were invited from parties relevant to the cause of the accident and the relevant State.</p>


2. FACTUAL INFORMATION

2.1 History of the Flight	According to the statements of the Pilot and Air Traffic Services Flight Information Officer (hereinafter referred to as the
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	<p>“Flight Information Officer”) of Oshima Airport Mobile Communication Station (hereinafter referred to as “Oshima Radio”), based on the records of communication with Oshima Radio and records of the direct line communication, the history of the flight up to the accident was summarized as follows:</p> <p>On February 11, 2017, at about 10:25, a privately owned Beechcraft 35-C33A, registered JA3357, took off from Honda Airport at Saitama Prefecture for a familiarization flight.</p> <p>The Pilot was heading to Oshima Airport as a destination along Miura Peninsula and started to contact with Oshima Radio at about 25 nm before the Airport.</p> <p>At around 10:55, the Pilot reported that he was at about 5 nm north of the Airport, at a same time, extended the landing gear and confirmed that the landing gear was down-locked based on the mechanical landing gear indicator and landing gear position lights. Oshima Radio reported to the Aircraft that there were no obstacles on a runway 21 to be used, the wind was 250° at 17 kt.</p> <p>At 10:58:43, Oshima Radio reported that the wind was 260° at 13 kt.</p> <p>Because the Pilot thought that the reported wind direction was 260° (from the right front) with the average velocity of 15 kt and the maximum instantaneous wind velocity of 22 kt. The turbulence was generated by a small hill called “Chigasaki” at the right side before the runway. So, he was flying as adjusting the descent rate at an altitude of about 1,000 ft or more till the turbulence was calmed. Then, the Pilot increased the descent rate to approach and touched down almost at the point of the touchdown mark in smooth with the flaps full down position.</p> <p>The Pilot continued the landing roll by using engine 1,200 rpm which was little more than normal rpm in order not to decelerate rapidly in consideration of a succeeding aircraft. At the time, because the Pilot felt uneasy about the strong wind and gust blowing, he was thinking whether to raise the flaps. But then, the nose dropped down suddenly, the propellers touched the ground and the engine stopped, but the Pilot could not understand the situations. Also, the Pilot heard intermittent sounds like a warning</p>
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	<p>horn.</p> <p>The Flight Information Officer saw the Aircraft shaking prior to the touchdown, but since the Aircraft was a small, he did not especially feel odd. And then, when he returned his eyes to the Aircraft after he had checked other plane on Aircraft Positioning Display, the Aircraft was facing the runway, fell forward and halted.</p> <p>At 11:00:16, the Flight Information Officer reported an occurrence of the accident to parties concerned via crash phone which is used for an emergency reporting.</p> <p>After the Aircraft halted, the Pilot reported to Oshima Radio that he would move the Aircraft, turned the master switch and fuel selector off and stepped out from the Aircraft. At this time, he saw the landing gear position switch and the flap position switch were at down position.</p> <p>As the Pilot inspected the Aircraft, the nose landing gear was retracted and the left main landing gear was partially retracted, the Aircraft was not able to move by a manpower.</p> <p>Later on, when a crane moved the Aircraft by hanging, the Pilot turned power-on to raise the flaps. And at the same time, he tried to move the landing gear position switch up and down for several times, the landing gear mechanism to retract or extend could not be operated.</p> <p>After the accident, the Pilot did not have memories to move the landing gear position switch up by mistakes when he had thought to raise the flaps during the landing roll, but he was not sure because of the accident situation.</p> <p>This accident occurred on the runway of Oshima Airport (34° 46' 59"N, 139° 21'39"E) at about 11:00 on February 11, 2017. (See Map surrounding the Accident Site)</p>
2.2 Injuries to persons	None
2.3 Damage to Aircraft	<p>Extent of damages to the Aircraft; Substantial damages</p> <p>(1) Nose Section</p> <p>Propeller; bowed, Downside Surface of the Nose; Scratched,</p>

	<p>Keel; Deformed</p> <p>(2) Nose Landing Gear</p> <p>Tires on Nose Landing Gear; Damaged, Retract Rod; Deformed/Broken Landing Gear Door; Deformed</p> <p>(3) Left Main Landing Gear</p> <p>Landing Gear Door; Deformed Tires on Left Main Landing Gear; Scratch Mark on the Outside Edge of the Tires</p>  <p>Photo 1 Accident Aircraft (after moving to an apron and extending the landing gear)</p>
<p>2.4 Personnel information</p>	<p>The Pilot Male, Age 48</p> <p>Private pilot certificate (airplane) March 19, 2000</p> <p>Type rating for Single engine (land)</p> <p>Specific pilot competency assessment</p> <p>Expiration date of piloting capable period; November 28, 2017</p> <p>Class 2 aviation medical certificate Validity; October 31, 2018</p> <p>Total Flight Time 413 hours 36 minutes</p> <p>Total flight time on the type of the Aircraft 160 hours 23 minutes</p> <p>Flight time in the last 30 days 4 hours 18 minutes</p>
<p>2.5 Aircraft information</p>	<p>(1) Aircraft; Beechcraft 35-C33A</p> <p>Serial Number; CE-175</p> <p>Date of Manufacture; September 18, 1967</p> <p>Certificate of Airworthiness; No. Dai-2016-585</p> <p>Validity; January 15, 2018</p> <p>Total Flight Time; 4,119 hours 08 minutes</p>

	<p>(2) At the time of the accident, an estimated weight of the Aircraft was approximately 2,530 lb and the weight and the balance were within the allowable ranges.</p>
<p>2.6 Meteorological information</p>	<p>(1) Routine Aviation Weather Observation at the airport (11:00) Wind direction 250 °; Wind direction variable; 210 ° to 290 ° Wind velocity 10 kt; Visibility 10 km or more Cloud; Amount 1/8, Type Cumulus, Cloud base 3,000 ft Temperature 8 °C, Dew point -6 °C Altimeter setting (QNH) 29.78 inHg</p> <p>(2) Instantaneous wind direction/velocity at side of the runway 21 10:58:00: 242 ° 10 kt, 58:30; 255° 13 kt, 59:00: 236 ° 19 kt 59:30: 238 ° 14 kt, 11:00:00: 231 ° 21 kt, 00:30: 263 ° 16 kt</p>
<p>2.7 Accident Site</p>	<p>The accident site was mostly on the runway centerline approximately 755 m inside from the runway 21 threshold at Oshima Airport. The Aircraft was halted in a position facing forward, as the nose landing gear were retracted, the left main landing gear was retracted by half, the right main landing gear was retracted by a little and the nose was touching ground</p> <p>On the runway, slash marks made by the propellers and scratch marks and others by the nose were continued from the point about 50 m before the Aircraft halted position to the Aircraft.</p>  <p style="text-align: center;">Photo 2 Landing gear at Accident Site</p>

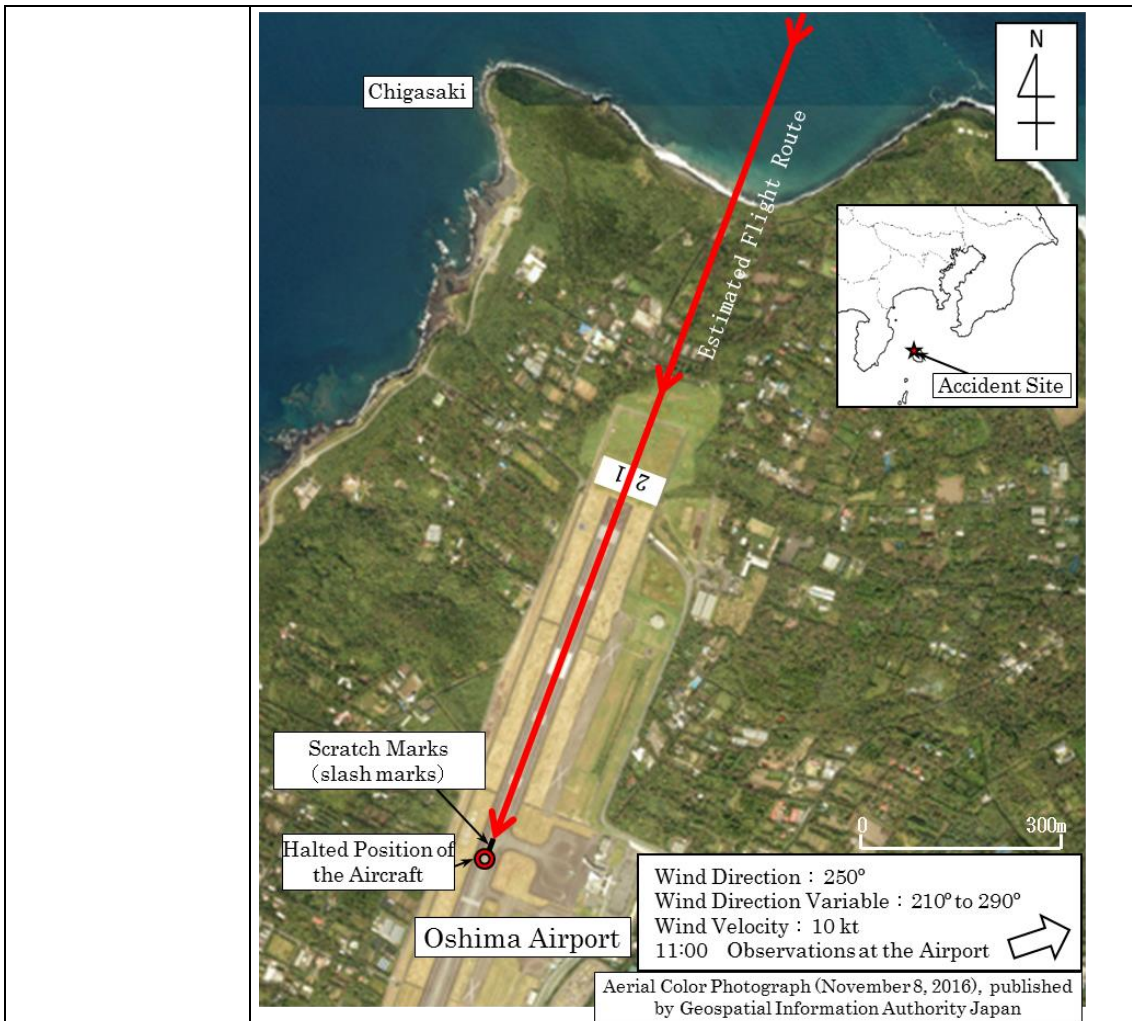


Figure Area Surrounding Accident Site

2.8 Additional information

(1) Outlines of Landing Gear System and Investigation result
 Outlines of the landing gear system and the investigation result of the Aircraft placed on a pedestal were as follows;

① Safety Device (Detent) of Landing Gear Position Switch

The landing gear position switch has two positions to retract and extend with dent (detent) in order to prevent switch to move opposite direction (return). When the landing gear position switch is operated, it has a mechanism to pull out the switch from the detent against the force of spring first, then move up or down.

At the time of investigation, it was confirmed that the detention mechanism worked normally.



Photo 3 Location of Flap position switch and Landing gear position switch

② Landing Gear Warning Device

When the right main landing gear strut is shortened more than the specified value, the safety switch equipped only on the right main landing gear strut will be activated and detect the situation of the Aircraft of being on the ground. When detecting the situation of being on the ground and the landing gear position switch is moved to up-position, the landing gear warning horn (intermittent sound) will be activated. Also, if any landing gear is at the position other than down-lock and the throttle is retarded to below specified value, the landing gear warning horn will be activated in order to prevent landing without extending the landing gears.

At the time of investigation, it is confirmed that there are no problem to activate a warning horn as setting the safety switch at situations of being on the ground and of being mid-air. Furthermore, it is confirmed that there are no problem to activate a warning horn as manually releasing the down-lock of the landing gear and changing the throttle position.

③ Landing gear mechanism to extend or retract

When the safety switch of the aircraft detects the situation of being on the ground, if the landing gear position switch is moved upward, the landing gear could not be retracted, when the safety switch detects the situation of

being mid-air, the landing gear motor is activated to retract.

At the time of investigation, it is confirmed that there are no problem for the landing gear mechanism to extend or retract as setting the safety switch to detect the situations of being on the ground or of being mid-air. Furthermore, after the occurrence of the accident, the circuit breaker for the landing gear motor was tripped.

(According to the record of the maintenance and the following test flight on January 16, 2017, it was confirmed that the landing gear system including the functions of the safety device of landing gear position switch, the landing gear warning horn and the landing gear mechanism to extend or retract were normal.)

(2) Safety Switch of the Landing Gear

Section VII LANDING GEAR SYSTEM of “BEECHCRAFT Debonair C33A The Pilot’s Operating Handbook” has the following descriptions;

SAFETY SWITCH

To prevent inadvertent retraction of the landing gear on the ground, a main strut safety switch opens the control circuit when the strut is compressed.

WARNING

Never relay on the safety switch to keep the gear down during taxi or on take-off, landing roll, or in a static condition. Always make certain that the landing gear switch is in the down position during these operations.

(3) Slash Marks

The space between the slash marks left on the runway at the time of retracting the landing gear was about 62 cm.

Based on this value and 1,200 rpm of the engine according to the statement of the Pilot, the estimated ground speed at the time of retracting the landing gear was approximately 48 kt.

(4) Stall Speed

The stall speed (airspeed) corresponding to the estimated weight of about 2,530 lb at the time of the accident based on the Section 5 Performance of Flight Manual are as follows;

	<p>At the down flaps; approximately 48 kt At the up flaps; approximately 57 kt</p> <p>(5) Flap Position Switch</p> <p>The flap position switch is a three-point switch as up-position, down-position and off-position. As same as the landing gear position switch, at first pull out from the detent against the force of spring and then move it vertically to change the position from each point.</p>
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3. ANALYSIS

3.1 Involvement of weather	Yes
3.2 Involvement Of pilot	Yes
3.3 Involvement of equipment	None
3.4 Analysis of known items	<p>(1) Effects of Meteorological Condition</p> <p>It is probable that regarding the wind at the runway 21 around the time zone of the accident, the situation for the wind direction and wind velocity were varying because the wind direction was mostly 020° to 050° from the right front with the wind velocity of 10 to 21 kt against the runway in use.</p> <p>(2) Damage to the Aircraft</p> <p>It is highly probable that the damage to the Aircraft was caused by the retraction of the landing gear because of no abnormality before the accident based on the statement of the Pilot and the results of the Aircraft investigation.</p> <p>(3) Situation at the Landing Roll</p> <p>Because the ground speed was estimated to be about 48 kt based on the slash mark, in consideration of the headwind component, it is probable that the Aircraft was on the landing roll at the airspeed faster than the stall speed (airspeed; about 48 kt). At the time, it is probable that the lift of the wings remained and the strut of the main landing gear was extended more than normal landing roll. It is probable that as being blown by the varying gust from the right caused the main</p>

landing strut to be shortened or extended. Because of this, it is probable that the safety switch which should detect the situation of being on the ground when the strut is shortened, detected the situations of being on the ground or being mid-air, alternately.

(4) Situation to Retract the Landing Gear

According to the statements of the Pilot, considering the effects of wind during the landing roll, it is somewhat likely that he tried to stabilize the Aircraft by raising flaps.

The Pilot stated that he did not have the memory of moving the landing gear position switch up by a mistake when he thought to raise the flaps. However, the detent of the landing gear position switch, the landing gear warning horn and the mechanism to extend or retract the landing gear were operated with no problem, and it is probable that an intermittent sound like warning horn that the Pilot heard was the warning horn activated because the landing gear position switch was moved to the up position while the safety switch was detecting the situation of being on the ground, therefore, it is somewhat likely that the Pilot moved the landing gear position switch to the up position.

Next, in the state of the landing gear position switch to be at the up position, because the safety switch that should prevent to retract the landing gear on the ground detected the situation of being mid-air as the Aircraft was blown by the wind, and then because the circuit to retract the landing gear was not opened, it is probable that the landing gear was retracted as the mechanism was activated.

Moreover, it is probable that based on the situation of the landing gear after the accident (the nose landing gear was retracted and the left and the right of the main landing gears was stopped in a way to be retracted) and the position (down position) of the landing gear position switch after the accident, the landing gear position switch, which was moved once to the up position, was returned back to the down position before the landing gear was fully retracted, therefore, the landing gear

	<p>motor reversed the rotation to the direction of extending the landing gear and this force bended retract rod of the nose landing gear in a process to push up the nose which was downed once. So, the nose landing gear was pushed into the nose wheel well by a dead weight of the Aircraft. Furthermore, it is probable that the circuit breaker was tripped and the activated motion was stopped, because the landing gear motor was overloaded because the main landing gear returned to the down direction against the dead weight.</p> <p>(5) Judgments and Action taken by the Pilot</p> <p>The Pilot, as considering the succeeding aircraft, continued the landing roll by increasing the engine rpm more than normal to avoid a rapid deceleration in the varying gust, and as thinking to raise the flaps to stabilize the Aircraft, it is somewhat likely that he moved the landing gear position switch instead of the flap position switch by a mistake, which located at the center lower position in the instrument panel and had a similar handling manner.</p> <p>(6) Prevention of occurrences of the similar accidents</p> <p>It is necessary to vacate a runway after performing full deceleration till an aircraft is stabilized without handling any switches, levers or others which are not required.</p> <p>When the switch, levers or others near the landing gear position switch will be handled, it is necessary to handle them for sure by visual confirmation.</p>
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4. PROBABLE CAUSES

<p>In this accident, it is probable that the Aircraft was damaged because the Aircraft retracted the landing gear during the landing roll.</p> <p>Regarding the retraction of landing gears during the landing roll, it is probable that there were possibilities for the Pilot to move the landing gear position switch to up position by a mistake instead of the flap position switch, and for the safety switch which should prevent to retract the landing gear on ground, not to open the landing gear retracting circuit because the safety switch had detected the situation of being mid-air due to the Aircraft was blown by wind at these conditions.</p>
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