

# AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

CASE WHERE A SLUNG LOAD CARRIED EXTERNAL TO THE  
AIRCRAFT WAS RELEASED UNINTENTIONALLY  
SAITAMA DISASTER PREVENTION AIR SQUADRON  
(ENTRUSTED OPERATIONS BY HONDA AIRWAYS CO., LTD.)  
AGUSTA AW139 (HELICOPTER), JA03FD  
IN HONDA AIRPORT,  
KAWAJIMA TOWN, HIKI COUNTY, SAITAMA PREFECTURE  
AT ABOUT 10:24 JST, FEBRUARY 17, 2024

May 16, 2025

Adopted by the Japan Transport Safety Board

Chairperson	RINOIE Kenichi
Member	TAKANO Shigeru
Member	MARUI Yuichi
Member	SODA Hisako
Member	TSUDA Hiroka
Member	MATSUI Yuko

## 1. PROCESS AND PROGRESS OF THE AIRCRAFT SERIOUS INCIDENT INVESTIGATION

<b>1.1 Summary of the Serious Incident</b>	<p>On Saturday, February 17, 2024, Agusta AW139, JA03FD, operated by Saitama Disaster Prevention Air Squadron was on a test flight to conduct load test required after hoist cable change, while hovering, inadvertently dropped the load weight and hoist cable inside Honda Airport.</p>
<b>1.2 Outline of the Serious Incident Investigation</b>	<p>The occurrence covered by this report falls under the category of “Case where a slung load carried external to the aircraft was released unintentionally” as stipulated in Article 166-4, item (xvi) of the Regulation for Enforcement of Civil Aeronautics Act of Japan (Order of Ministry of Transport Regulation No. 56, 1952) and is classified as a serious incident.</p> <p>On February 18, 2024, the Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator to investigate this serious incident.</p> <p>An accredited representative and an adviser of the Italian Republic, as the State of Design of the helicopter, and an accredited representative and an adviser of the United States of America, as the State of Manufacture of the helicopter and also Design and Manufacture of the external hoist of the helicopter, participated in this investigation.</p> <p>Comments on the draft Final Report from parties relevant to the</p>

	cause of the serious incident and comments from the relevant States were invited.
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## 2. FACTUAL INFORMATION

<p><b>2.1 History of the Flight</b></p>	<p>The history of the flight was summarized as follows based on the statements of captain, co-pilot, a Saitama Disaster Prevention Air Squadron Officer (hereinafter referred to as “Air Squadron Officer”), and Mechanic A who were on board the helicopter upon occurrence.</p> <p>On Saturday, February 17, 2024, about 10:14 Japan Standard Time (JST: UTC + 9hrs, unless otherwise stated all times are indicated in JST on a 24-hour clock), Agusta AW139, JA03FD, operated as Saitama Disaster Prevention Air Squadron, took off from helipad located in Honda Airways Co. Ltd. (hereinafter referred to as “the company”) for test flight to perform load test required after external hoist (hereinafter referred to as “hoist”) cable replacement, with the captain in the right seat, the co-pilot in the left seat, and the Air Squadron Officer for the hoist operation and Mechanic A instructing hoist inspection and checking result in aft seat. The helicopter then flew close to Taxiway E4 at Honda Airport and hovered at altitude 50 ft (Figure 2).</p> <p>The load test required after cable replacement, confirms each function of hoist operates normally with maximum Hoist load, 600lb. (about 272 kg). In this case, the cable had been replaced the day before by Mechanic B and C, and it was planned to conduct load test, with 136 kg weight, half the maximum load (two 68 kg weights) and 272 kg weight, the maximum load (four 68 kg weights), on the hook at the end of the cable (hereinafter referred to as “the hook”).</p>
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Figure 1 Dropped Weight

At about 10:17, for the first load test, the helicopter reeled out the cable to the ground at a hovering height of about 50 ft, and ground crew hooked a 136 kg weight. The helicopter then climbed to hovering altitude of about 340 ft, the Air Squadron Officer began to reel out cable to the maximum length (about 300 ft), which was for Mechanic A to confirm that



Figure 2 Serious Incident Site


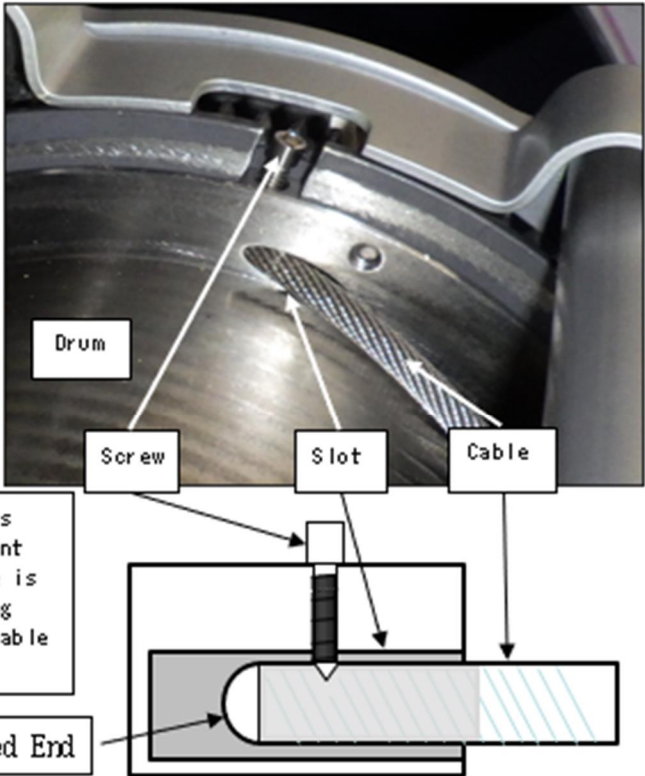
it would automatically stop at the maximum length.

The Air Squadron Officer reeled out the cable, about the time to stop automatically, the weight fell to the ground along with the cable. (Fig. 1)

The position of the weight and cable drop was grass area near Taxiway E4 of Honda Airport and there was no damage to ground objects. As ground crew had evacuated about 30 m from the drop position so no one was injured.

The serious incident occurred at Honda Airport in Kawajima Town, Hiki County, Saitama Prefecture (35° 58' 32" N, 139° 31' 32" E) at about 10:24 on February 17, 2024.

<b>2.2 Injuries to Persons</b>	None														
<b>2.3 Damage to the Aircraft</b>	None														
<b>2.4 Personnel Information</b>	<p>(1) Captain: Age 57</p> <table> <tr> <td>Commercial pilot certificate (Helicopter)</td><td>October 5, 1993</td></tr> <tr> <td>Expiration Date of Piloting Capable Period</td><td>June 26, 2025</td></tr> <tr> <td>Type rating for Agusta AB139</td><td>March 12, 2012</td></tr> </table> <p>(2) Mechanic B: Age 55</p> <table> <tr> <td>Aircraft Maintenance Engineer Certificate Class 1 (Helicopter)</td><td>January 26, 1995</td></tr> <tr> <td>Type rating for Agusta AB139</td><td>January 10, 2012</td></tr> </table> <p>(3) Mechanic C: Age 53</p> <table> <tr> <td>Aircraft Maintenance Engineer Certificate Class 1 (Helicopter):</td><td>June 24, 1998</td></tr> <tr> <td>Type rating for Agusta AB139</td><td>January 10, 2012</td></tr> </table>	Commercial pilot certificate (Helicopter)	October 5, 1993	Expiration Date of Piloting Capable Period	June 26, 2025	Type rating for Agusta AB139	March 12, 2012	Aircraft Maintenance Engineer Certificate Class 1 (Helicopter)	January 26, 1995	Type rating for Agusta AB139	January 10, 2012	Aircraft Maintenance Engineer Certificate Class 1 (Helicopter):	June 24, 1998	Type rating for Agusta AB139	January 10, 2012
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<b>2.5 Aircraft Information</b>	Aircraft Type: Agusta AW139 Serial number: 41274                      Date of manufacture: October 21, 2011 Certificate of airworthiness: No. Toh-2023-180      Validity: August 7, 2024
<b>2.6 Meteorological Information</b>	<p>The weather observations at the Saitama Regional Meteorological Observatory Station, located about 13 km south-southeast of the serious incident site, around the time of the serious incident were as follows:</p> <p>10:20 Wind direction: North-northwest, Wind velocity: 2.7 m/s  Temperature: 8.3 °C</p>
<b>2.7 Additional Information</b>	<p>(1) The Hoist of the Helicopter</p> <p>The hoist of the helicopter is installed on the upper right side of the cabin and operates by electric motor (Figure 3).</p> <p>The cable is 307 ft (about 93.5 m) long, has a diameter of 4.75 mm, and is wrapped on an aluminum drum.</p> <p>The cable is inserted in the slot of drum and fixed by tightening the screw against the cable strand (Figure 4). As the end of the cable is welded to prevent fraying, the screw must contact the cable strand and not the welded end.</p> <p>The hoist is fitted with limit switches which automatically stop the drum when remaining cable gets to 3.5 to 4.5 wraps.</p> <div data-bbox="464 976 772 1205">  <p>Hoist</p> </div> <p>Figure 3 Hoist</p> <div data-bbox="790 976 1437 1749">  <p>Drum</p> <p>Screw</p> <p>Slot</p> <p>Cable</p> <p>Welded End</p> <p>The cable end is welded to prevent fray, and cable is fixed by placing screw against cable strand.</p> </div> <p>Figure 4 Cable End Attachment (Image)</p> <p>(2) Replacement to the New Cable (hereinafter referred to as "new cable") which dropped in the Serious Incident.</p> <p>There was unacceptable bird caging on the cable (hereinafter referred to as "old cable"), old cable was replaced.</p>

On February 15, Mechanic B began to unwind the old cable using the thumb wheel on the pendant with the hoist installed on the helicopter. Mechanic B stopped unwinding when the full-out limit switch actuated and the drum stopped, confirmed that the number of cable wrap which was 4 remaining on the drum and took a photo with his smartphone. And then, Mechanic B removed the screw which fixed the cable end (hereinafter referred to as “the old screw”) to pulled out the old cable from the slot on the drum and completed the day.



Figure 5 Pendant

On February 16, Mechanic C started to install the new cable. Looking at the picture Mechanic B provided, Mechanic C wound four wraps of the new cable on the drum. And then Mechanic C applied anti-seize compound to the new screw and temporarily tightened the screw into the screw hole by hand. In the next step, Mechanic C inserted the end of the new cable into the slot to the end, confirmed that the white marked end was barely visible. Mechanic C tightened the new screw which was temporarily screwed to the specified value using a torque wrench, pulled the cable to check if it is tight and completed the new cable installation.

Then Mechanic B joined, and was asked to check the cable attachment and both of them performed the operation check required after the cable replacement, checking operation of limit switches and movements.

### (3) Cable Replacement Procedure

a. According to the maintenance procedure (AW139 AMP: Aircraft Maintenance Publication) (hereinafter referred to as “AMP”) provided by the helicopter design and manufacturer (hereinafter referred to as “helicopter manufacturer”), the cable replacement procedure is as follows:

(Excerpt and Summary)

- (a) Remove the variable speed controller.
- (b) Remove the cover attached to the hoist to access the full-out limit switch.
- (c) Carefully operate the actuator of the full-out limit switch with an applicable plastic pin to deactivate so that the drum does not automatically stop due to the full-out limit switch actuation.
- (d) Use the thumb wheel on the pendant to slowly unwind the cable from the drum.
- (e) Check that less than 1 turn of cable stays on the drum, set the thumb wheel to OFF.
- (f) Remove the old cable.
- (g) Install the new cable as follows:



- a) Put the cable in its position below the rescue hoist.
- b) Insert the upper cable end into the slot on the drum.
- c) Apply anti-seize compound to threads of the new screw.
- d) Secure the end of the cable in the slot by tightening the screw.
- e) Torque the screw to the specified value.
- f) Pull the cable in strong tension to check if it is tightly locked by screw. If the screw correctly locks the cable, it will remain tight with no movements.

The warning for the cable installation is as follows:

(Summary)

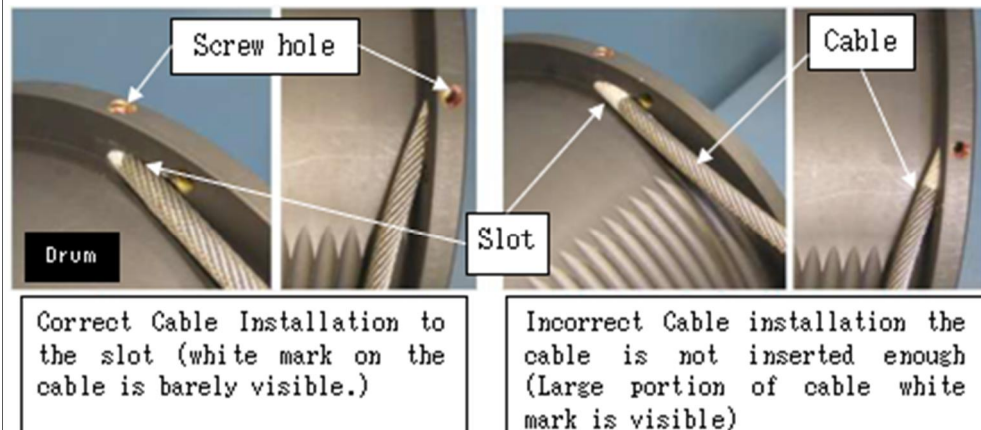


Figure 6 Precautions for Inserting Cable End (from AMP)

Make sure that the screw engages sufficiently the cable end to safety the cable correctly into the drum shoulder. To do this, you can see only a small part of the cable white mark that goes out of cable housing in the drum shoulder (Figure 6). Carefully obey the given precautions before you install the applicable screw to prevent unwanted loss of cable.

- b. The Component Maintenance Manual (hereinafter referred to as "CMM"), which is the maintenance procedure prepared by the hoist design and manufacturer (hereinafter referred to as "hoist manufacturer"), describes the following procedures for inserting the cable into the slot (Excerpt and Summary)

Insert white stained end of cable in the hole of drum. Check for proper installation of the cable by looking through the screw hole. Ensure the white stained end of the cable is visible through the screw hole and is barely visible from outside. This ensures the cable is properly inserted far enough and the cable attach screw will contact the cable strands and not the welded end.

#### (4) Detailed Examination of the Hoist Used in the Serious Incident

The hoist used in this serious incident was examined in detail at the approved MRO, with the helicopter and hoist manufacturer. The result of the examination was as follows:

- a. Basic functions of the hoist

The basic functions of the hoist, such as responses to various switched and motor operations, were checked in accordance with the

manufacturer's manual and no failure was found.

b. Checking the limit switch operation

Speed limit and full-out switches of the hoist was tested, with and without the maximum load applied and no failure was found.

c. Hoist condition at the time of the serious incident

The amount of cable paid out from the hoist at the time of the serious incident was 300 ft, and the hoist normally stopped with full-out limit switches operated.

The screw condition at the time of the serious incident was observed from the slot and the tip of the screw protruding in the slot (Figure 7). It

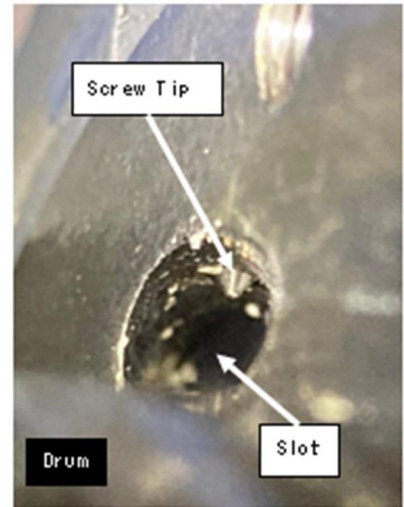


Figure 7 Screw tip condition at the Serious Incident

was also confirmed that when the cable was inserted into the slot, the cable came in contact with the protruding tip and could not insert any further, and that a large portion of the cable white mark was visible. (Figure 6).

Next, the screw was removed and it was confirmed that the screw had been screwed for six turns. When the cable was correctly fixed with the screw tip on the strand following the procedure described in AMP, with the specified torque value was reached at eight turns.

d. Comparing New and Old Cable Ends

When the new and old cable ends were compared, on the old cable, there was a conical dent where the old screw seemed to have been tightened on the strands, but there was no such dent on the new cable end. (Figure 8).

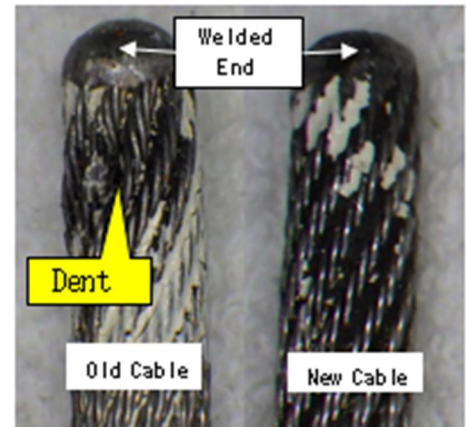


Figure 8 Difference on Cable Ends

In addition, it was confirmed that the same dent found on the strands of the old cable was also found on the strands of the new cable, after specified torque value had been applied at eight turns.

(5) Similar Incident on Agusta AW139 Helicopter

In June 2021, overseas, an AW139 helicopter with same type hoist while performing load test dropped weight and cable.

a. Overview of the similar incident

An AW139 helicopter with same type hoist was performing load test after replacing the cable, hoist operator began to unwind the cable,

	<p>with 300lb. weight hanging. The drum stopped at maximum length with the full-out limit switch was actuated. Few seconds later, the hoist operator saw the cable come off and fell with the weight to the ground with a large sound.</p> <p>b. Summary of the investigation of the similar incident</p> <p>In this case, the investigation was conducted by the AW139 helicopter and the hoist manufacturer. The results were as follow:</p> <p>(a) No dent from the screw was found at the end of the cable.</p> <p>(b) At the time of this incident, with the condition of the screw, the cable was able to be inserted to the end of the slot without resistance.</p> <p>(c) When the limit switch was actuated, the number of wraps of cable remaining on the drum was three wraps, which was less than the specified value (3.5 to 4.5 wraps).</p> <p>Based on these findings, it was determined that the cause of this incident was the failure to properly tighten the relevant screw to hold the cable and the incorrect setting of the full-out limit switch.</p> <p>c. Corrective actions for the similar incident</p> <p>The CMM prepared by the hoist design and manufacturing company specifies that after the cable replacement, load test procedures should be performed to ensure that the cable has been installed correctly and to condition the cable to the drum.</p> <p>However, the AMP did not originally require load test after cable replacement. Helicopter Manufacturer revised the AMP to require load test after cable replacement just 10 days before this incident occurred. Therefore, it was possible that an operator, who had replaced cable prior to this incident have not performed load test. On August 5, 2021, as a corrective action, the AW139 helicopter manufacturer issued Emergency Alert Service Bulletin EASB139-679 for operators who had replaced cables to perform load test in prior to the next hoist usage. In addition, the European Aviation Safety Agency (EASA) issued the Alert Airworthiness Directive EASA AD 2021-0186E on August 6, 2021, based on this Emergency Alert Service Bulletin.</p>
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### 3. ANALYSIS

#### (1) Cable Installation into Drum

The results of the detailed examination of the hoist in 2.7 (4) were as follows:

- a When the screw was tightened to the specified value, the number of turns of the screw into the screw hole was less.
- b No conical dent was found in the strands of the new cable.

Based on these results, it is most likely that the new screw was not properly screwed to the new cable strands and came in contact with the welded end of the new cable. (Figure 9)



Therefore, it is most likely that the new cable was not properly fixed to the drum and when the new cable was fully unwound during the load test, the new cable detached from the drum and fell along with the weight. At the end of the cable replacement, the Mechanics pulled the new cable to check that it would come loose, but it is possible that the new cable was tightened by new screw against the welding area and could not easily pulled out. It is probable that the new screw, which was not properly fixed, loosened while the various operational tests and the new cable detached with the load during the load test.

The new screw had not been screwed into the new cable properly, probably because of the following procedure was performed when cable was replaced.

AMP specifies when removing the old cable, the variable speed controller is to be removed and override the full out limit switch to completely unwind the cable, but in this case, Mechanic B wound out the cable at the automatic stop with four wraps of cable remaining on the drum, disengaged the cable end and removed the cable.

As a result, when installing the new cable, Mechanic C had to wind the cable four wraps, at which point the full out limit switch would activate, before inserting the cable into the slot, which more likely reduced workability and made it difficult to fully insert the cable.

When performing maintenance work, it is important to always check the procedures and follow them carefully.

#### (2) Visual Check of the Cable Insertion Length

In the CMM prepared by the hoist manufacturer, in addition of checking the insertion length by the white stained end of the cable as required by the AMP, also requires that the correct installation of the cable should be checked by looking through the screw hole. It is desirable to confirm that the cable is fully inserted visually through the screw hole to install the cable correctly.

#### (3) Safety Management of Load Test

Although this case was a result of unintended object drop, as the flight was done as a part of maintenance work with the possibility of object drop, safety precautions such as evacuation of personnel were taken so there were no damage to people or property.

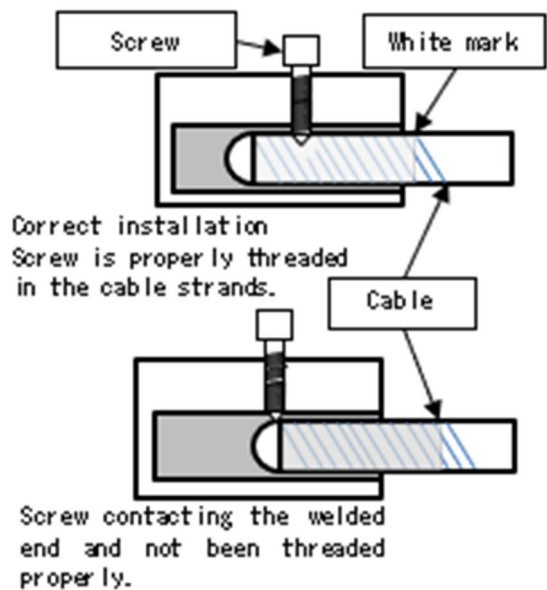


Figure 9 Failure in cable installation

## 4. PROBABLE CAUSES

The JTSB concludes that the probable cause of this serious incident was that the load test was conducted most likely without the cable properly attached to the drum when it was replaced, causing the cable to come loose from the drum when it was fully unwound the cable detached from the drum and fell with the weight.

The reason why the cable was not properly attached to the drum probably because the cable had not been replaced in accordance with specified maintenance procedure.

## 5. SAFETY ACTIONS

5.1 Safety Actions	As mentioned in "ANALYSIS", upon maintenance work, including
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<b>Required</b>	<p>cable replacement, it is required to check and precisely follow the work procedures.</p> <p>In addition, to firmly secure the cable, mechanic is required to ensure the cable visually through the screw hole in addition to checking the insertion length, in accordance with the revised AMP.</p>
<b>5.2 Safety Actions Taken after the Serious Incident</b>	<p>(1) Safety Actions Taken by Honda Airways Co. Ltd. after this Serious Incident</p> <ul style="list-style-type: none"> <li>a This case was introduced within the company, and the mechanics were reminded to follow the maintenance procedures for all work.</li> <li>b The task card for the cable replacement have been revised in line with the revised AMP, and mechanics was requested to strictly follow the newly added procedure.</li> <li>c In addition to specified maintenance procedure, original check procedures were added to ensure that the cable is secured firmly.</li> </ul> <p>(2) Safety Actions Taken by the Manufacturer</p> <p>After this serious incident, the helicopter manufacturer revised AMP and added a Caution note to ensure that the cable is inserted correctly by looking through the screw hole when the cable is attached to the drum.</p>