

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	1) EMB-145EP, G-SAJK 2) Cessna P210N Pressurized Centurion, G-CDMH
<b>No &amp; Type of Engines:</b>	1) 2 Allison AE 3007/A1/1 turbofan engines 2) 1 Continental Motors TSIO-520-P piston engine
<b>Year of Manufacture:</b>	1) 1999 (Serial no: 145153) 2) 1978 (Serial no: P210-00131)
<b>Date &amp; Time (UTC):</b>	7 August 2019 at 1740 hrs
<b>Location:</b>	London Southend Airport
<b>Type of Flight:</b>	1) Commercial Air Transport (Passenger) 2) Private
<b>Persons on Board:</b>	1) Crew - 3                      Passengers - 35 2) Crew - 1                      Passengers - None
<b>Injuries:</b>	1) Crew - None                  Passengers - None 2) Crew - None                  Passengers - N/A
<b>Nature of Damage:</b>	1) None reported 2) None reported
<b>Commander's Licence:</b>	1) Airline Transport Pilot's Licence 2) Private Pilot's Licence
<b>Commander's Age:</b>	1) 39 years 2) 51 years
<b>Commander's Flying Experience:</b>	1) 7,453 hours (of which 1,075 were on type) Last 90 days - 110 hours Last 28 days - 74 hours  2) 1,930 hours (of which 169 were on type) Last 90 days - 23 hours Last 28 days - 10 hours
<b>Information Source:</b>	AAIB Field Investigation

**Synopsis**

An Embraer 145 landing at London Southend Airport ran over a general aviation towbar which had been dropped on the runway. No damage was caused to the aircraft. The investigation found that the towbar had fallen from a Cessna 210 which departed Southend Airport 30 minutes before. The Cessna pilot had likely been distracted during his pre-flight checks by an earlier road traffic incident in which he was involved, and had inadvertently left the towbar attached.

One Safety Recommendation has been made to the CAA to improve the visibility of general aviation ground equipment.

## History of the flight

### *G-SAJK – Embraer 145*

G-SAJK was operating a scheduled service from Aberdeen to Southend, and made a normal approach to Runway 23 at Southend Airport, landing at 1815 hrs. The weather conditions were CAVOK. On landing, as the commander applied the brakes, he saw an object on the right of the centreline approximately 8 – 10 m in front of the aircraft. He estimated that the aircraft was travelling at between 105 and 110 kt at this stage. He applied slight left rudder as the object disappeared out of view and felt a small bump through the rudder pedals but was not sure if this was caused by the aircraft clipping the object or running over the centreline. The aircraft stopped, backtracked and vacated the runway normally.

The commander reported the sighting to ATC who requested a runway inspection, which found a general aviation towbar (Figure 1) on the runway. There were no indications of any damage to the aircraft, so the commander continued to taxi the aircraft to stand. After the passengers had disembarked, both pilots inspected the aircraft but found no damage.

The commander recalled that the object had been very difficult to see against the dark asphalt runway. He only saw it because part of the towbar was lying across the white centreline markings. He recalled that it was located just after Taxiway B.

Shortly after the Embraer landed, Southend ATC received a call from Farnborough Radar. They had been notified by the pilot of a Cessna P210 (G-CDMH), which had departed Southend Airport at 1747 hrs, that he thought he may have departed with the towbar still attached.

### *G-CDMH - Cessna 210*

The pilot flew to Southend Airport regularly as he had an office nearby. He travelled between his office and the airport by motorcycle. On the day of the incident, whilst riding to the airport, a cyclist pulled out in front of him. He was able to miss the cyclist, and no one was injured, but the pilot described it as “a fright and a close shave.” He continued to the airport, pulled the aircraft out of the hangar and completed the pre-flight checks. The start-up was uneventful but, as he taxied to the runway, he noticed a slight tendency for the aircraft to track to the left. However, he considered it minor and made a mental note to check the tyre pressures on landing. The pilot reported that the takeoff from Runway 23 seemed entirely uneventful.

Approximately 30 minutes into the flight he was thinking about the tracking issue and it occurred to him that he could not positively remember removing and stowing the towbar. He knew the towbar was no longer attached to the aircraft because the landing gear had successfully retracted. He immediately reported his concern to Farnborough Radar and asked for a message to be passed to Southend. The pilot continued his planned flight and landed without further incident. He inspected the aircraft after landing and did not find any damage.

The pilot discovered that he had also left his bags behind in the hangar at Southend. He reflected that he was distracted by the earlier motorcycle incident and that this was “on his mind” whilst completing the pre-flight checks. He reported that “the towbar is a small stowable unit that does not extend outwards much more than the tip of the spinner, but it is quite obvious and I cannot believe that I missed it.”

### ATC report

After the landing Embraer reported seeing the towbar, ATC asked an operations vehicle to inspect the runway. They recovered the towbar from the runway approximately 50 m to the west of Taxiway B (Figure 1). There were scuff marks on the handle of the towbar. Between G-CDMH departing and G-SAJK landing two other aircraft had used the runway and a runway inspection had been carried out. Table 1 gives a summary of the timeline provided by ATC.

TIME	EVENT
1739	G-CDMH has cleared to taxi to holding point D where the aircraft carried out power checks.
1743	G-CDMH reported ready for departure.
1746	G-CDMH was cleared for takeoff and was recorded as airborne at 1747 hrs. G-CDMH was subsequently handed-over to Southend Radar.
1749	A PA-28 on a local flight was cleared to land on Runway 23.
1752	The PA-28 landed.
1753	An Operations vehicle was cleared to enter the Runway at C1 to complete an inspection. The vehicle entered the Runway initially in a south-westerly direction and on return vacated at Taxiway D at 1757 hrs.
1759	A Britten-Norman Islander was cleared to taxi to A1 and was then cleared to takeoff at 1801 hrs. The aircraft was recorded as airborne at 1803 hrs.
1811	G-SAJK was cleared to land.
1815	G-SAJK landed and the commander reported the aircraft had colliding with a general aviation towbar on the runway.
1817	An operations vehicle recovered the towbar adjacent to Taxiway B.
1825	ATC received a call from Farnborough Radar reporting the G-CDMH may not have removed their towbar prior to departure.

**Table 1**

Summary of the timeline of the incident

ATC reported that it was not possible to see the towbar from the control tower due to its size, shape and colour. They also reported that at the time of the event the location of the evening sun made it harder to see objects on the runway.



**Figure 1**

Towbar recovered from the runway

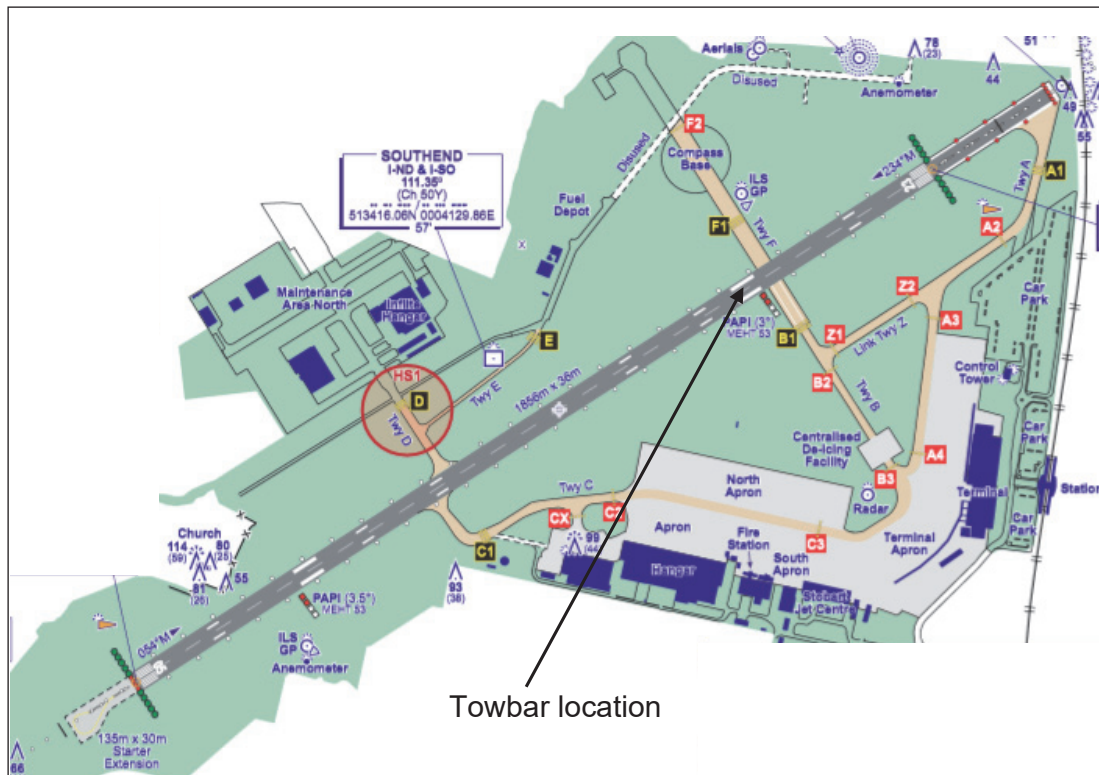
### **Runway inspection report**

At 1751 hrs a fire officer driving an airport operations vehicle requested permission to enter the runway for a wildlife inspection. Permission was granted at 1753 hrs. He entered the runway at C1 and proceeded south-west toward the Runway 05 threshold. He reported that when he entered the runway there was no wildlife activity, so he carried out a surface inspection. From the Runway 05 threshold he recalled that he drove to the Runway 23 threshold then back to Taxiway D where he vacated. He did not see the towbar. He vacated the runway at 1757 hrs.

It was reported that because his initial intention was to complete a wildlife inspection his attention may have been directed towards the sky rather than on the surface which may be why he did not see the towbar.

## Airfield information

London Southend Airport has a single asphalt runway orientated 05/23 (Figure 2).



**Figure 2**

London Southend Airport Chart showing approximate location the towbar was found.

The airport does not have any electronic means of detecting objects on the runway, taxiways or apron<sup>1</sup> so relies on them being seen during runway inspections or being reported by other airfield users.

London Southend Airport procedures specify a minimum of one runway inspection every four hours and two complete movement area inspections daily. On the day of the incident, airport records show that the last full runway inspection was completed at 1515 hrs. The inspection which occurred between the Cessna departing and the Embraer landing was intended to be a wildlife inspection and not considered a full runway inspection.

## Personnel

The pilot of the Cessna 210 (G-CDMH) held a Private Pilot's Licence with valid Single Engine Piston, Multi Engine Piston and Instrument (IR) ratings. He had a total of 1,930 flying hours with 169 hours on the Cessna 210. He had flown 10 hours in the last 28 days and 23 hours in the last 90 days.

## Footnote

<sup>1</sup> Some larger airports have 'foreign object detection radar' which can detect objects on the runway and issue alerts to ATC.

## Pre-flight checklist

During the airport's investigation into this incident it was noted that the pre-flight checklist used by the pilot did not include any reference to ensuring the towbar, or other ground equipment, is removed before flight.

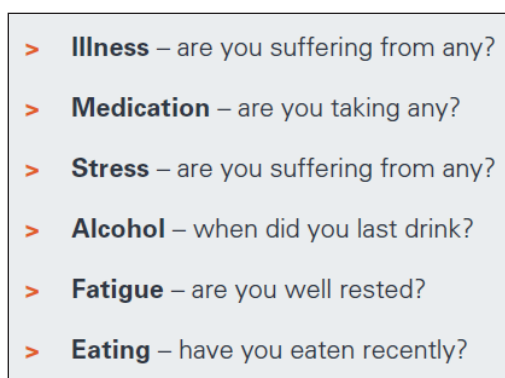
Following the incident, the pilot amended his checklist to add a reminder to remove and stow the towbar. Additionally, he added a visual reminder in the cockpit of G-CDMH.

## Other human factors

The pilot was involved in a motorcycle incident during his drive to the airport. He reported that this incident was "on his mind" during his pre-flight checks and probably contributed to him forgetting to remove the towbar. Additionally, he left two of his bags behind at the airport which also suggests he was distracted.

A stressful or traumatic event can be distracting and difficult to put out of mind. It may be tempting to continue with a planned operation and not realise the effect of such an event on subsequent performance.

The CAA Skyway Code<sup>2</sup> highlights the importance of pilots assessing their fitness to fly before any flight. The code suggests using the 'IM SAFE' mnemonic for self-assessing fitness for flight (Figure 3). In this incident 'stress' from the earlier motorcycle incident was probably a key factor.

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- > **Illness** – are you suffering from any?
  - > **Medication** – are you taking any?
  - > **Stress** – are you suffering from any?
  - > **Alcohol** – when did you last drink?
  - > **Fatigue** – are you well rested?
  - > **Eating** – have you eaten recently?

**Figure 3**

'IM SAFE' mnemonic highlighted in the CAA Skyway Code

## Ground equipment markings

The towbar was painted in a dark blue paint (Figure 1) which made it difficult to see against the dark asphalt runway surface.

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### Footnote

<sup>2</sup> CAA skyway Code is available at <https://www.caa.co.uk/General-aviation/Safety-information/The-Skyway-Code> (accessed 16 October 2019)



The International Air Transport Association (IATA) Airport Handling Manual (AHM)<sup>3</sup> provides recommendations for aircraft ground support equipment. AMH 913 section 14 lists the following recommendations for non-motorised ground support equipment:

*'14.2.1 Non-motorised Ground Support Equipment should be visible to the operator(s) of any approaching Ground Support Equipment within the safety braking distance and under any angle of approach.*

*14.2.2 Colour schemes for markings of reflective material should be in compliance with the marking and illumination standards established by the local regulatory authorities. The reflective material shall be resistant to wear and tear.*

*14.2.3 Non-motorised Ground Support Equipment should have its presence accentuated by application of reflective material on all sides of the equipment inclusive of the tow-bar, outriggers or any other deployable devices.*

*14.2.4 Non-motorised Ground Support Equipment should have a minimum of 2 markings of reflective material on each side of the equipment with a maximum separation distance of 1.5 m (60 in) between each marking. Each marking should not be less than 100 cm<sup>2</sup> (15.49 in<sup>2</sup>).*

*14.2.5 Markings of reflective material should also be applied on all comers of the equipment.'*

## Analysis

The pilot of a Cessna 210 departing from Southend Airport inadvertently left the aircraft's towbar attached to the nosewheel. As the aircraft took off the towbar fell off and landed on the runway. The towbar remained on the runway for approximately 30 minutes during which time another aircraft landed, another took off and an operations vehicle completed an inspection. A landing Embraer 145 ran over the towbar during its landing roll.

The pilot of the Cessna reported that he was distracted by an early road traffic incident and this is probably why he forgot to remove the towbar. The incident highlights how stress from events unrelated to flying can cause a significant distraction and the importance of pilots honestly assessing their fitness for flight prior to every flight.

The towbar was not seen on the runway by two other aircraft that used the runway nor by a fire officer conducting an inspection. It is not known exactly which part of the runway the two aircraft used, so it is possible they did not pass the towbar. Alternatively, their attention may have been on flying their aircraft. The inspection was initially intended to be a wildlife inspection, so it is possible that the driver's attention was focused towards the sky rather than the runway surface. However, the towbar was painted in dark colours so it did not stand out against the runway surface. The towbar might have been seen sooner if it had reflective or other high visibility markings.

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## Footnote

<sup>3</sup> IATA Airport Handling Manual is available at <https://www.iata.org/publications/store/Pages/airport-handling-manual.aspx> (accessed 16 October 2019)

Most airports do not currently have automatic means of detecting objects on the manoeuvring area, so they rely on them being seen during inspections or being seen by other airport users. Therefore, it is important that any equipment that could be left on a manoeuvring area is highly visible.

The IATA AHM provides recommendations for ground handling equipment to ensure it is clearly visible. However, these are not widely applied across general aviation ground equipment. Making ground equipment more visible would reduce the likelihood of it being left attached to the aircraft and increase the chance of it being seen quickly if it is left on a runway or manoeuvring area.

During this incident no damage was caused to the landing aircraft. However, objects on the manoeuvring area have the potential to cause serious harm to aircraft.

Therefore, the following Safety Recommendation is made:

#### **Safety Recommendation 2020-004**

It is recommended that the Civil Aviation Authority communicate to the general aviation community the importance of increasing the visibility of ground equipment.

#### **Conclusion**

A general aviation towbar was inadvertently left attached to an aircraft because the pilot had been distracted by an earlier stressful event during his journey to the airport. The towbar dropped onto the runway during the departure and remained there for approximately 30 minutes, during which two other aircraft used the runway and a runway inspection was completed. A landing aircraft then ran over it. The towbar was inconspicuous because it did not have any reflective or other high visibility markings.

#### **Safety action**

The CAA has stated that if, during the general aviation-specific audits and inspections it conducts, it observes ground equipment that due to its colour is not sufficiently visible, it will bring this to the attention of the relevant operator.

*Published: 23 January 2020.*