

ACCIDENT

Aircraft Type and Registration:	Boeing 737-45D, SP-LLB	
No & Type of Engines:	2 CFM56-3C1 turbofan engines	
Year of Manufacture:	1993	
Date & Time (UTC):	20 February 2006 at 1140 hrs	
Location:	Stand 114, London Heathrow Airport	
Type of Flight:	Public Transport (Passenger)	
Persons on Board:	Crew - 6	Passengers - 89
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Wing tip light and some structural damage to wing tip	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	59 years	
Commander's Flying Experience:	11,725 hours (of which 7,680 were on type) Last 90 days - 160 hours Last 28 days - 65 hours	
Information Source:	AAIB Field Investigation	

Synopsis

While taxiing onto its assigned parking stand, the aircraft struck a vehicle which was parked in a prohibited area. The member of ground staff whose responsibility it was to ensure that the stand was unobstructed was unable to see the whole stand from his assigned position in the jetty. Members of ground staff who saw the potential conflict were unable to alert the pilots. Three Safety Recommendations were made.

History of the flight (flight crew perspective)

The aircraft departed Warsaw, Poland at 0758 hrs on the first leg of a scheduled service to London Heathrow Airport and return. The departure had been delayed by approximately two hours due to snow clearance, but the commander and co-pilot considered themselves

well rested, having started their duty at 0545 hrs after a preceding rest period of 15 hours and 48 hours respectively. After landing at Heathrow Airport at 1130 hrs, the aircraft proceeded as instructed to Stand 114 at the head of the Kilo cul-de-sac of Terminal 1 (shown in Figure 1). As the aircraft approached the stand the co-pilot noted that a van was parked on the right side of the stand, in an area marked with painted 'hatched' lines, but did not consider that it would present a hazard to the aircraft. The commander stated that he was aware of the confined nature of the stand and that this may have caused him to commence his turn onto the stand earlier than indicated by the yellow lead-in line painted on the taxiway adjacent to the stand. As a result, the aircraft did not gain the centreline before

it crossed the stand threshold. Shortly afterwards, before the aircraft had reached the normal stopping position adjacent to the stand's manoeuvrable jetty, its right wingtip hit the van, causing damage to wing tip fairings and the rear of the van. The commander, who was aware of the impact, shut down the aircraft and ordered a normal disembarkation using mobile steps.

History of the flight (ground crew perspective)

A dispatcher, employed by another airline on behalf of the aircraft operator, arrived at Stand 114 shortly before the aircraft. In accordance with his duties, he checked that the stand area was clear of obstructions before activating the stand guidance system. Having done so, he climbed a set of external steps to the head of the jetty (known as the cab) and positioned himself at the controls in order to manoeuvre the jetty when the aircraft arrived. As he did so, he noticed that a vehicle had moved onto the right hand side of the stand. When the aircraft entered the stand he was no longer able to see the parked position of the van from his viewpoint in the jetty. He noted, however, that several employees of the handling agent, whose vehicles and equipment were parked in the non-hatched area to the right of the stand, appeared to have seen the aircraft approaching and were attempting to signal it to stop by crossing their arms above their heads. He discovered later that they had been unsuccessful.

The driver of the van, a ramp agent, was employed by the handling agent assigned by the aircraft operator to assist the loading and servicing of its aircraft at London Heathrow Airport. He drove onto the stand from an airside road adjacent to the terminal and intended to park on the right side of the stand, facing away from the approaching aircraft. As he did so he saw that other employees of the handling agent were attempting to manoeuvre baggage trolleys into the same area and

decided to reverse temporarily into the hatched area of the interstand clearway in order not to obstruct them. He kept the engine of the van running and, aware that the aircraft was approaching, intended to return to the non-hatched area as soon as the baggage trolleys were in place. He was unable to do so before the aircraft hit the van.

Stand characteristics

Stand 114 is located at the end of a cul-de-sac, between Pier 3 and the 'Europier' of Terminal 1 (Figure 1). To its left is a baggage storage area adjacent to a part of the terminal building which forms the cul-de-sac, and to its right is another stand of similar dimensions. Due to the confined nature of its location it is restricted to the operation of Boeing 737 or smaller aircraft. A yellow lead-in line, painted on the taxiway leading to the stand, is intended to indicate to pilots the safe approach course to the stand centreline. The history of successful manoeuvring on to this stand demonstrates that a safe approach will result if the nose wheel of the aircraft is steered over this lead-in line.

Guidance along the centreline of the stand is provided by an Azimuth Guidance for Nose-In Stands (AGNIS) system. The system is designed to be viewed from the left pilot's seat and displays two closely spaced vertical light bars mounted in a box, as illustrated in Figure 2. The light bars display one red bar and one green bar as illustrated in Figure 2 (i) & (iii), indicating that the pilot should steer away from the red towards the green bar, or two green bars, indicating correct alignment, as illustrated in Figure 2 (ii).

The correct stopping position is indicated by a mirror system, which is also designed to be viewed from the left pilot's seat. It consists of a mirror mounted to the left of the stand centreline facing the approaching



Figure 1

Location of Stand 114 (in black circle)

aircraft and angled so that the pilot can see the reflection of the aircraft's nose wheel during the last few metres of the parking manoeuvre. The correct stopping position is indicated by a yellow line, labelled with the appropriate aircraft type, which is painted on the stand surface perpendicular to the centreline. Stand 114 had only one such line, labelled 'B737'.

An emergency stop light, located beside the AGNIS indicator, will illuminate if either of two emergency stop buttons is pressed. One button is located in the jetty cab and the other at the head of the stand, to the left of the stand centreline. Members of ground staff who were best able to see the potential conflict between the aircraft and the van were working to the right of the stand centreline.

The incident aircraft had not reached the normal stopping

position, nor had it gained the stand centreline, when it struck the van. When viewed from the commander's seat in the cockpit immediately after the incident, the AGNIS indicated that the aircraft was right of the centreline.

Damage to aircraft and vehicle

The aircraft and vehicle were examined by the AAIB before being moved from the positions in which they had stopped. The right wingtip of the aircraft had struck the upper left corner of the rear of the truck, causing relatively minor damage to the vehicle but crushing the wingtip of the aircraft and destroying the navigation and strobe lights.

It was noted that the aircraft was slightly to the right of the stand centreline marking (the left nosewheel tyre was just touching the right side of the line) and that the aircraft heading was a few degrees to the left of the line, indicating that it was still in the process of turning right. As the crew reported no system or other malfunctions prior to contact with the truck, no technical examination of the aircraft was deemed necessary.

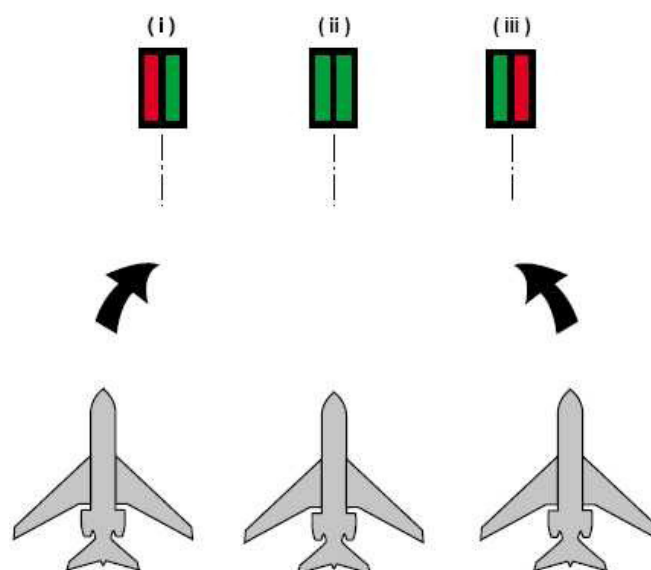


Figure 2

AGNIS

Recorded data

The Flight Data Recorder was not recovered as the investigation did not require the data. The Cockpit Voice Recorder was recovered and might have been useful but had been overwritten. Ground radar recordings were reviewed and found to be of no value to the investigation as the event occurred in a radar shadow.

Ground staff responsibilities

The *Airside Safety and Driving Code* handbook, produced by the handling agent, provides information to its employees who are required to drive airside. It states:

'On either side of an aircraft stand you may find an interstand road/clearway. You are not permitted to park there but you may wait provided the driver remains in the cab so as the vehicle can be driven away to prevent obstruction – caution must be observed at all times.'

It also states

'Never obstruct hatched areas'.

The van driver was aware of this information. He believed, however, that it was acceptable for him to wait in the hatched area at the end of the interstand clearway with the engine running.

CAP 637 – *Visual Aids Handbook*, published by the CAA, contains the diagram shown in Figure 3.

The *Airside Safety and Driving Code* handbook contains an almost identical diagram.

Additional information

Rule 37 (2) of the Air Navigation Order states:

Notwithstanding any air traffic control clearance it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft or with any vehicle.

Analysis

Stand markings

Diagrams explaining stand markings, produced in CAP 637 and the *Airside Safety and Driving Code* handbook, showed hatched areas associated with the jetty manoeuvring area only and it was not clear from these diagrams or related text that hatched areas were

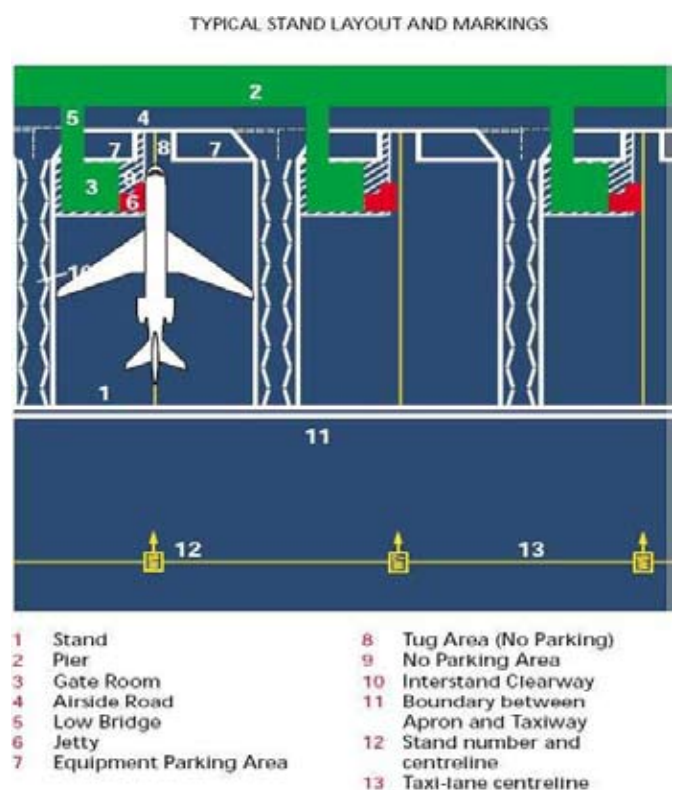


Figure 3

Typical stand layout and markings
(extract from CAP 637)

also to be found in the interstand clearways, as in the case of Stand 114. Consequently, it was not clear that parking might be prohibited altogether in some parts of an interstand clearway. Therefore, the following two recommendations are made.

Safety Recommendation 2006–138

It is recommended that the Civil Aviation Authority should amend CAP 637 – *Visual Aids Handbook*, to clarify those areas where parking is prohibited.

Safety Recommendation 2006–139

It is recommended that Aviance UK should amend the *Airside Safety and Driving Code* handbook to clarify those areas where parking is prohibited.

Provision and use of emergency stop signals

Conflicts between moving aircraft and obstructions on the ground can develop very quickly and it may be necessary to alert pilots at a moment's notice to avoid a collision. The emergency stop signal at the head of a stand is the recognised means of alerting pilots in such circumstances. It follows that any delay or difficulty in operating this signal will reduce the effectiveness of the signal itself.

A button for operation of the emergency stop signal was provided at ground level and in the jetty. The jetty operator was not able to see the entire stand once the aircraft entered it and so was not aware that a conflict existed. Those ground staff who were aware of the potential conflict attempted to signal the aircraft to stop using hand signals but apparently were unsuccessful. The pilots might have been alerted more effectively had one of the ground staff been near enough to an emergency stop button to press it as soon as the conflict was recognised. The following safety recommendation is therefore made:

Safety Recommendation 2006–140

It is recommended that the BAA should examine the practicability of requiring a member of the ground crew to assume the responsibility of being adjacent to the ground level emergency STOP light button, and of monitoring the arrival of the aircraft on to the stand, whenever ground crews are present on a stand whilst an aircraft is manoeuvring to park.

Conclusion

The right wingtip of the aircraft struck a van which was parked in an area of the stand which should have been free from all obstructions. The driver of the van was aware that he should not park there and had intended to move to a different position prior to the arrival of the aircraft. Congestion in the baggage handling area of the stand prevented him from doing so. The pilots were aware that the van was parked incorrectly but elected to continue onto the stand, believing that it would not be an obstacle. This would have been the case if the aircraft had been lined up on the stand centreline before entering the stand. However, the commander, aware of the confined nature of the stand, made a tighter turn onto the stand than that indicated by the lead-in line painted on the ground and remained at all times to the right of the stand centreline.

Members of ground staff who were aware of the potential conflict were not able to operate the emergency stop signal button because it was located on the other side of the stand centreline and not within immediate reach of their normal working area. From his position in the jetty cab, which was also equipped with an emergency stop button, the member of ground staff responsible for ensuring the stand was clear before the aircraft arrived was not able to see the entire stand after the aircraft entered it. He could not see the van, which had entered the stand after he completed his ground check, and consequently did not appreciate the potential conflict.