

# GHOST

GROUND HANDLING OPERATIONS SAFETY TEAM

## What Is He Doing?

The circumstances surrounding this safety event were no different to many others; time pressures, distraction and complacency crept into what had become a very repetitive process... all contributory factors for what happened that afternoon.



Despite being just under twenty minutes behind schedule, the turnaround had gone well and now the aircraft was being pushed back for its mid-afternoon departure. Air Traffic Control had made a request to the flight crew for them to pull forward, adjacent to stand three, to allow for another company aircraft to access stand five. This request was passed to the headset operative, which was verbally confirmed and duly completed.

As the pushback tug came to a halt after the pull forward manoeuvre, the routine and familiar communications relating to brakes, engine start and equipment disconnection were exchanged.

**Headset Operative;** “as the number two engine was spooling up, I disconnected the tug from the towbar and then went under the nose to disconnect it from the aircraft. Sometimes the mechanism can be a bit tricky to release, so you need to get it straight and give it a firm pull, whilst remembering not to hit your head on the landing gear doors! As I got a good grip on the lever, I suddenly noticed the aircraft starting to move toward me! I just managed to get out of the way of the towbar as it rotated toward me and shouted “STOP! STOP! STOP!” into the headset... What is he doing?”

**Captain;** “as the number two engine was spooling up, both of our heads were down in the flight deck, monitoring the various instruments required for engine start... oil pressures, rotation speeds, fuel flow, temperatures etc. When I flew this aircraft a few days ago, the start valve had been problematic but today, all appeared well. Once number two had stabilised, my hands went back up to the overhead panel to select the start switch for the number one. As I turned the selector anti-clockwise into position, I suddenly heard “STOP! STOP! STOP!” in my ears... What is he doing?”

**Headset Operative and Captain;** “It was lucky nobody was killed!”

## Background

Over recent years, many safety reports have been submitted relating to aircraft moving and/or starting to taxi whilst ground crews and their equipment are still under the nose of the aircraft. A selection of examples follows:

- Shortly after giving permission to start engine number one, the aircraft began to taxi forward. I immediately advised the flight crew that I was still in position and the aircraft stopped immediately.
- After removing the bypass pin, the operative bent down to take the chock away from the nose wheel. It was a bit stuck but as it came free, the aircraft started to roll forward. He jumped back to get out of the way. The tug driver also stepped back and quickly signalled to the flight deck, who applied the brakes immediately. The aircraft had moved forward about three feet;
- The pilot gave the headset man permission to disconnect. Before he could remove the bypass pin, the aircraft started to taxi, with the headset man still attached and the pushback tug sitting in front of the aircraft.
- The headset man asked for the parking brake to be set. He noted the parking brake light illuminate and started the towbar disconnection process. As the tug reversed back in readiness to re-attach the tow bar, he noticed the aircraft moving forwards with the towbar still attached. He quickly asked the Captain to reset the parking brake - The Captain informed the headset man that he had not given permission for the towbar to be disconnected.

The subsequent investigations believed there were a number of reasons why. Flight crews had:

- Verbally reported that the parking brake had been set but had not done so, possibly only applying the foot brakes.
- Inadvertently released the brakes whilst performing pre-flight procedures.
- Attempted to taxi the aircraft before ground crews and/or equipment had vacated the danger area.

Note: Forward movement can be easily achieved without any increase in thrust, especially if the taxiway is sloped or the aircraft is at a light weight.

Several reports stated that the flight crew had not given permission for the ground crew to go under the aircraft to disconnect the equipment, but they had done so anyway...

## Contributory Factors

When analysing the reasons why this type of event occurs, there are many factors to consider. It is obvious that a number of challenges face both flight and ground crews during this phase of the

departure. Despite those challenges, all related communications must be clear and concise, and strict adherence to standard procedures is required at all times.

**Time pressure** is certainly one of the most predominant behavioural influences. In order to achieve schedules, or make up lost time, personnel will often do what they can for the perceived benefit of the operation. Unfortunately, this can sometimes stray into the realms of rushing, which can leave individuals extremely vulnerable to error. If you are being rushed, politely ask the other person to 'stand by' whilst you complete your task.

**Communications** must be clear and concise as headset conversations can be a challenge at the best of times. Instructions and confirmations relating to the disconnection process are typically given whilst engines are starting or running. This creates significant background noise, which can mean that it is quite difficult to actually hear what is being said at both ends of the wire. The numerous national and international accents within our industry can also add to that aural complexity.

Repetitive communications can lead humans to hear what they want to hear, rather than what was actually spoken. This can trigger 'standard' responses and actions, even if what was said was different or even incorrect. If you are in any doubt as to what was said, ask for verification, every time.

**Distractions** are plentiful during this phase of the departure and need to be managed. For the flight crew, there are instruments to monitor, checklists to complete and clearances to be sought. Often, the 'thank you and goodbye' message is passed all too quickly but caution must be exercised, as it is possible the ground crew may still be disconnecting the pushback equipment and have not yet vacated the aircraft footprint.

Flight crews must wait for positive verification that all equipment and personnel are at a safe distance, before any attempt is made to release the parking brake and taxi the aircraft. Never assume that because you are ready, your colleagues on the ground will be. In addition to any verbal confirmation that the ground crew is clear, a visual check must be conducted.



### Industry Standard Communications

An obvious but often overlooked cause of communication errors and/or misunderstanding is alignment between Ground and Flight Operations manuals. This includes the checklists used by the flight crew during the departure process. The IATA Ground Operations Manual (IGOM) Chapter 4 Aircraft Turnaround 4.6.6.3 provides an industry standard for items to be communicated between ground and flight crews.

Phase	Task	Ground Staff Action
<b>Departure Preparation</b>	GPU removal	When instructed by flight crew, remove GPU.
	Towbar/TWL Tractor connection	(a) Get confirmation that aircraft parking brake is set. (b) Get confirmation that the nose wheel steering is depressurized or advise flight crew that the steering bypass pin is inserted, if applicable. (c) Connect the Towbar. (d) Connect the TWL tractor.
	Chock removal	(a) Get confirmation from flight crew that aircraft parking brake is set. (b) Remove chocks.
	Pre-departure check	Advise flight crew that the pre-departure check has been completed or communicate any discrepancies.
<b>Engine Start</b>	Starting engines	When requested by the flight crew, advise when the engines may be started and the start sequence.
	ASU	When requested by the flight crew, signal to the ASU operator to supply the required pressure.
<b>Pushback &amp; Engine Start</b>	Brakes	Get confirmation that aircraft parking brake has been released.
	Movement of the aircraft (pushback/pull out)	Get permission from flight crew, to commence the pushback.
	Direction of push/nose	If applicable, ask in which direction the aircraft must be pushed or in which direction the nose should point after pushback.
	Engine start	When requested by the flight crew, advise when the engines may be started.
<b>Pushback Completed &amp; Engine Start Completed</b>	Towbar/TWL Tractor disconnect	(a) Get confirmation that the aircraft parking brake is set. (b) Disconnect. (c) Remove the steering bypass pin, if applicable.
	Headset removal	(a) Get permission from flight crew to disconnect the headset. (b) Advise the flight crew to hold position and wait for visual signal at left/front/right of the aircraft.
<b>Departure</b>	“All Clear” Signal	(a) Verify steering bypass pin removal has been completed, if applicable. (b) Give the “All Clear” signal when the path of the aircraft is clear of all obstacles. (c) Get acknowledgement from the flight crew of the of “All Clear” signal.

## Other Considerations

### Physical Barriers

In order to mitigate the associated risks during the disconnection process, the majority of Ground Handling Agents require their personnel to position the pushback tug in front of the aircraft, as a visual indicator to flight crew and also place a 'safety' chock just forward of the nose wheel. The chock is there to protect them from unexpected and unintentional movement by providing a deliberate barrier in front of the aircraft... its value being proven on many occasions.

This use of a chock as a barrier is not completely without danger. There is a possibility that if the chock was poorly positioned and struck with enough force, the aircraft could jump it and with the steering by-pass pin still installed, skew the nose landing gear wheels around. This is even more likely if the surfaces are contaminated or there is a downhill slope.

A number of airport operators have expressed concern regarding the risk of FOD, from chocks that might get left out on the live taxiway during this process. Whilst the removal and retrieval of the chock should be an obvious action, it cannot always be guaranteed.



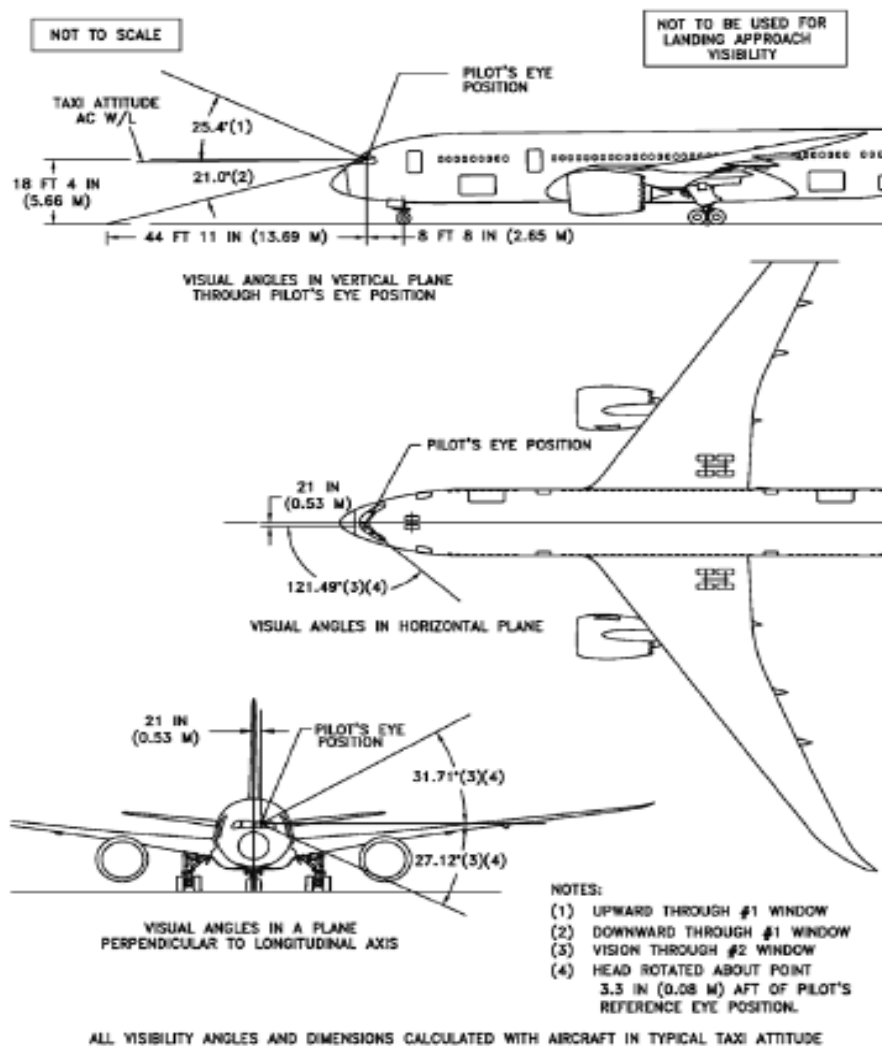
At night-time, this process becomes even more important as many chocks are nicely camouflaged against their natural background! During this phase of operation, the area under the nose of the aircraft becomes very poorly lit. Especially once the pushback tug has turned away from the aircraft and the light from its headlights are no longer available. However, a number of chock manufacturers are starting to produce brightly coloured products that will hopefully assist visibility issues.

Ground handling agents and airport operators must consider appropriate stowage for chocks, particularly where agents have to 'hot stand' with other agents. For control and convenience purposes, chocks are often seen to be stored on the top of pushback tugs. It only takes one decent bump and FOD, in the shape of a chock, will materialize.



### Visibility

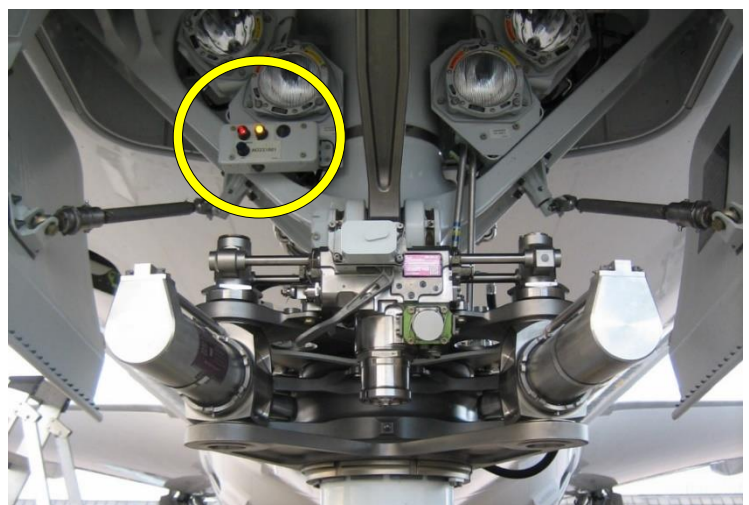
Flight and ground operations personnel must be also be fully aware of any aircraft type restrictions that may hinder visibility from the flight deck to the ground and vice versa. The aircraft manufacturer can provide this information. Below is an example of related data, provided by Boeing:



## Indicator Lights

Some aircraft types are fitted with an indicator light on the aircraft's nose landing gear strut, which illuminates when the parking brake is set.

There have been a number of occasions when the extinguishing of this light has indicated to the ground crew, that the brakes have been prematurely released and would therefore appear to be a robust warning. However, it would be unreasonable to expect the ground operative to conduct his/her under-wing responsibilities and duties, with one eye constantly on the light. There is also the possibility that the bulb is not functioning, after all it is only an indication light.



Regardless, unless it has been established that the light is inoperative, Ground Handling Agents could still require headset operatives to conduct a visual check of this light, when the “Brakes Set” request is given. If the light is not illuminated, the request to set the brakes should be repeated.

## Summary

It is very easy for repetitive procedures to lose their significance over time. The consequences related to this safety critical activity, which consists of people working in the proximity of a live aircraft, are unthinkable.

Hopefully this article will provoke a few thoughts, provide a few explanatory considerations and most importantly remind all that safety is the number one priority. Therefore, in the interest of best practice, GHOST and the UKFSC recommend that stakeholders consider the following basic actions:

- Ensure that related procedures, documents and training are fully reviewed for depth and accuracy.
- Specifically check that all Flight and Ground Operations Manuals align.
- Conduct a review of related monitoring activities to ensure that this topic is appropriately checked for compliance.
- Encourage personnel to report related incidents, including near misses, and;
- Work together during the subsequent investigations, to understand why they occurred.

**For any related comments, feedback or information please contact [GHOST@caa.co.uk](mailto:GHOST@caa.co.uk)**