

## Collision with a runway vehicle during pushback

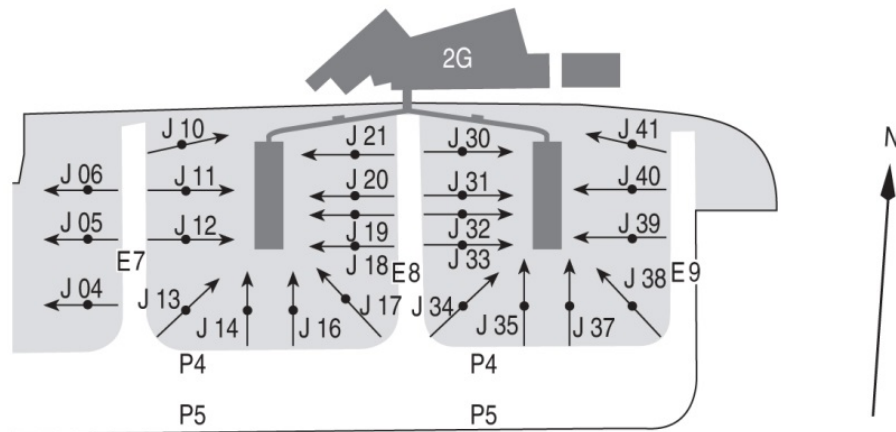
<b>Aircraft</b>	Embraer 190 registered F-HBLF
<b>Date and time</b>	19 April 2014 at about 07 h 50 <sup>(1)</sup>
<b>Operator</b>	Régional
<b>Place</b>	Paris Charles-de-Gaulle Airport (95)
<b>Type of flight</b>	Public transport, commercial operations, passengers
<b>Persons on board</b>	Captain, copilot, 3 cabin crew, 98 passengers
<b>Consequences and damage</b>	Lower part of fuselage severely damaged

<sup>(1)</sup>Except where otherwise indicated, times in this report are expressed in UTC. Two hours should be added to obtain the legal time in France on the day of the event.

*This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.*

### 1 - HISTORY OF FLIGHT

The crew of F-HBLF called the "De Gaulle Trafic" frequency to ask for approval for pushback from stand J10 at terminal 2G for a flight bound for Clermont-Ferrand Auvergne airport (63). The apron management services agent asked them to push back facing east.



(source SIA)

Figure 1 - Plan of aeroplane stands, terminal 2G (CDG)

The crew of the aeroplane parked at J11, then also requested pushback. In order to allow this aeroplane to start its manoeuvre sooner, the apron management services agent then asked the crew of F-HBLF to be towed, with the assistance of a tug, after its pushback, facing south until abeam stand 12 at the end of their pushback. This entire manoeuvre is what is referred to in French as a "push-pull".

During the pushback, the crew of F-HBLF started the aeroplane's two engines, which stabilised at ground idle. Following the pushback from J10, the aeroplane was on the axis specified in the documentation (see below).



(source ADP)

Figure 2 - detail of stands and daytime ground lighting

In order to position the aeroplane on the centreline of taxiway E7, the tug driver had to make the aeroplane make a turn of about 90° with a short turn radius. To do this, he positioned his tug at approximately 90° to the aeroplane axis. When the tug began to pull the aeroplane, the safety cotter pins on the tow bar coupling head broke. The coupling head was then only connected to the tow bar by an axle around which it could pivot horizontally.

Under the effect of its inertia and the thrust of the two engines at idle, the aeroplane continued to advance in a straight line. When the coupling head reached the stop, the aeroplane pivoted towards the right and collided with the tug.

## 2 - ADDITIONAL INFORMATION

### 2.1 Procedure for pushback from stand J10

The specific instructions for manoeuvring at apron stands (CPEX in French)<sup>(2)</sup>, published by Paris Aéroport<sup>(3)</sup> and intended for users of these aprons, states that *"in accordance with instructions from ATC and validation by the aircraft Captain"*, the pushback from J10 can be carried out in two different ways:

- facing east, on a specific axis line painted in white, or
- facing north, initially, then aligned facing west on taxiway P4.

The north then west-facing procedure is longer and little used because of the length of the pushback, among other reasons.

<sup>(2)</sup>Version n° 5 applicable from 21/12/2013.

<sup>(3)</sup>Previously known as "Aéroports de Paris".

In case of a pushback facing east, it is stated that it is forbidden to pull the aeroplane forward again with the aid of a tug, the departure being undertaken autonomously after the pushback.

The specific Instructions for manoeuvring at apron stands are written by Paris Aéroport in association with the SNA-RP<sup>(4)</sup> then distributed to airlines, runway service companies and to the SNA-RP.

The apron management service's operations manual repeats the same instructions as well as the ban on "*push-pull*" departures from stand J10. This "*push-pull*" procedure is however authorised and regularly used at other stands on the apron in order to facilitate the flow of traffic and avoid jet blast in case of simultaneous pushbacks.

Drivers indicated that, generally speaking, they do not question requests from apron management service agents, even if they are aware of the ban in the operations manual.

## 2.2 History of pushback events from J10

In February 2008, during the creation of the aeroplane parking positions at terminal 2G, the pushback procedure initially planned for J10 was a "*push-pull*".

On 12 April 2008, while a Fokker 100 was being pulled back again by a tug, the latter collided with the aeroplane and punctured the fuselage. Following this event, an urgent instruction was issued by ADP on 24 April 2008 to modify the procedure for a pushback with a tug, followed by an autonomous departure. On 3 September 2008, a new version of the CPEX was published, making this procedure definitive.

On 12 October 2009, during the pull back of an Embraer 170, requested by the apron management service agent, the safety cotter pin on the tow bar broke and the tug collided with the aeroplane. On 13 October, the instruction was completed by an explicit warning that pull back was banned ("*le pull est interdit*").

In order to pull the aeroplane forward after a pushback facing east, the tug must in fact be positioned at a sharp angle in relation to the aeroplane's axis. During towing in this configuration, the risk of breaking the safety cotter pins on the tow bar is greatly increased. The "*push-pull*" manoeuvres usually carried out are undertaken with force applied by the tug, which is approximately lined up on the aeroplane's axis, which limits the risks of tow bar safety cotter pin failure.

## 3 - LESSONS LEARNED AND CONCLUSION

The apron management services agent asked that the pushback be followed by a pull forward with the assistance of the tug, despite the ban in the apron management services operations manual on carrying out this manoeuvre on departure from stand J10.

The common use of this manoeuvre at the other stands and the absence of any explanation of the reasons for the ban at that specific stand likely led the apron management services agent to request a non-standard procedure.

The tug driver did not question the request from the apron management services agent and repeated by the crew of F-HBLF. The operating instructions in fact specify that the latter are *"according to the instructions from ATC and validation by the aircraft Captain"*.

In order to be able to pull the aeroplane, the driver had to set an excessive angle between the tow bar and the aeroplane's axis. The link between the tug and the aeroplane then broke. The aeroplane's inertia following its being moved and the thrust from its engines at idle made the aeroplane move forward, which led to the collision with the tug.

Following this event, the apron management services operations manual was modified to make clear the reasons for the ban.