Airbus A321-211, G-JSJX

AAIB Bulletin No:	**Ref: EW/G2001/04/22**	**Category: 1.1**

INCIDENT

Aircraft Type and Registration:	Airbus A321-211, G-JSJX	
No & Type of Engines:	2 CFM56-5B3/P turbofan engines	
Year of Manufacture:	1997	
Date & Time (UTC):	19 April 2001 at 0604 hrs	
Location:	Birmingham International Airport	
Type of Flight:	Public Transport	
Persons on Board:	Crew - 9	Passengers - 167
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Dent and puncture in lower fuselage skin	
Commander's Licence:	Airline Transport Pilots Licence	
Commander's Age:	36 years	
Commander's Flying Experience:	4,388 hours (of which 1,149 were on type)	
	Last 90 days - 117 hours	
	Last 28 days - 45 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

History of incident

The commander reported that he had completed a normal pushback prior to engine start. However, as the aircraft was being towed forward and to the left, it came to a halt with a 'judder'. The commander was informed by the ground handler that the right forward edge of the tug was wedged under the aircraft. The tug driver considered that the nose of the aircraft appeared to come down onto the top of the cab of his tug. An engineer was called and he informed the commander that the tug was stuck and that the fuselage was punctured. It was necessary to move some of the passengers from the front to the rear of the cabin to enable the tug to be removed.

Photographs taken at the scene show that there was only a very small area of fescalized portion apparent on the oleo of the nose gear. Additionally, there was evidence of fluid spots on both nose tyres. However, the engineer who was called to the aircraft stated that he inspected the nose assembly shortly after the incident and that it had no apparent faults. After the incident, there was no rectification recorded to the nose gear assembly. No reason could be found for the fluid spots on the tyres seen on the photographs but the tyres remained on the aircraft for some time after the incident.

Subsequent investigation

There was a full complement of personnel used in the pushback and all of them had been trained and were qualified for the task.

The tractor unit used in the incident was a Mercury Standard; this was a four wheel, cabbed vehicle. The driver cab is located at the front of the vehicle and extends to some 2 metres above the ground. Normal procedure for pushback is that the tow bar is attached to the cab end of the tug to enable the driver to look directly at both the aircraft and the ground handling safety personnel. There is a further attachment point at the rear of the tug but this is only used for a direct tow. The normal pushback attachment means that the higher part (cab) of the tug is nearer the aircraft.

The tow bar used in the incident was a Universal Tow-Bar Assembly designed for the A320/321 aircraft. Measurements taken with the same configuration of aircraft and tow assembly shows that the distance from nose gear attachment to tug attachment was some 2.5 metres; the cab was approximately 0.36 metres behind the tug attachment point. The distance from the nose gear to the nose of the aircraft was 5 metres showing that the cabin of the tug was under the aircraft during the pushback manoeuvre. The damage on the aircraft was in an area approximately 2 metres above the ground; the height of the fuselage above the ground varies with the weight and CG of the aircraft.

With the combination of tug and tow-bar used during the incident, there was the potential for contact between the cab of the tug and the fuselage underside of the aircraft. A straight push or tow ensures clearance but any combination of relative angles between the tow-bar and the tug reduces this clearance. Evidence from this incident indicates that the tow-bar was angled to the right of the aircraft and the tug was turned to the left. Prior to this incident, the ground-handling organisation had completed numerous uneventful manoeuvres with the same type of aircraft and pushback combination. In accordance with the guidance contained within CAP 642, Airfield Safety Management, they had carried out initial and periodic risk assessments of their pushback procedures and these had been audited by both the airline concerned and the airport authority. Nevertheless, the potential collision risk had not been identified.

Subsequent to the incident, the ground-handling organisation instigated action to reduce the collision risk. As a short-term measure, they have issued guidance to their personnel on the issues concerned in the incident and the need for increased awareness. Concurrently they are also actively pursuing physical means to extend the distance between the tug and aircraft.