

The Dutch Safety Board

Occurrence #:	2004089	Classification:	Serious incident
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FACTUAL INFORMATION

Date of the occurrence:	14-06-2004	Flight crew:)
Place of the occurrence:	Amsterdam (EHAM)	Cabin crew:)
Aircraft registration:	EP-IBA) Total:	250
Aircraft model:	Airbus A300-600	Passengers:)
Aircraft type:	Passenger aircraft		
Type of flight:	Scheduled flight	Injuries:	None
Phase of operation:	Taxiing		
Damage to aircraft:	Substantial	Lighting conditions:	Daylight

The flight and the incident

Flight IranAir, IRA 764, was a scheduled passengers flight from Amsterdam Airport Schiphol (EHAM) to Teheran/Mehrabad (THR/OIII). At 13:47 UTC IRA reports on the frequency with Schiphol delivery. Within the next minutes the engines were started and a push back before taxi was completed. IRA 764 was cleared to taxi via taxiway B north to runway 09. At 13:59 ATC requested IRA 764 to increase its taxi speed as there is traffic behind. Sometime after this request an aircraft taxiing behind IRA 764 reported patches of smoke coming from the left tyres and brakes area of IRA 764. IRA 764 copied this message but reported that there were no unusual indications in the cockpit.

Shortly afterwards IRA 764 reported to the Air Traffic Control (ATC) heating on the left wheel brake and requested the brake to be checked by their own (on board) ground mechanics. This was at first refused because first the fire brigade had to check the supposed overheated break of the Left Hand (LH) Main Landing Gear (MLG). Therefore ATC requested IRA 764 to switch off their engines. Only after several request and demands IRA 764 was willing to do so. A visual inspection was carried out by the on board ground mechanics and a ground mechanic of a local maintenance company. A misalignment of wheel no. 5 was observed. After been towed back to the parking area removal of the wheel revealed that the axle and axle sleeve were sheared off. The tire had not been deflated.

Investigation & Analysis

The damaged parts were sent to Messier-Services Molsheim for investigation: LH MLG bogie, wheel, brake unit and bearing components. Some components appeared to be lost (rollers and races) during recovery or storage by the operator, and had not been sent to Molsheim. The axle was sent to Messier-Dowty Laboratory for investigation, the wheel and brake were sent to Messier-Bugatti and the Brake Cooling Fan (BCF) was investigated by Technofan.

The conclusion brought up by the different examinations performed by Messier-Bugatti, Messier-Dowty and Technofan lead to the following possible scenario for axle rupture:

- The root cause of the wheel axle rupture is an overheating which led to spreading of cadmium plating within the steel, making it fragile to rupture. Metallurgical investigations performed on the axle show an obvious cadmium embrittlement within the base material leading to a crack initiation and then an intergranular propagation leading to final static rupture. Overheating of the axle is a consequence of bearing overheating.
- Overheating trace on the brake cool fan revealed that the BCF has not been the source of the overheating. The origin of overheating is located at the external bearing zone.
- Regarding the root causes linked to the brake the scenarios of abnormal braking energy absorption/ dragging conditions or wheel failure producing heat by the way of mechanical interference during aircraft rolling, are not confirmed because no fuse plugs were melted and the tire was not deflated. Although a given level of temperature was reached on the outer wheel hub and spoke area this did not reach the 183°C fuse plug melting threshold.

- The bearing failure would be the only overheating source identified in the wheel and brake system.
- Rollers and races were not retrieved; root cause of the roller bearing seizure will remain undetermined (lack of lubrication, corrosion, over torque, excessive wear).



Note: This report has been published in English and Dutch language. If there are differences in interpretation the Dutch text prevails.