Airbus A320-212, G-DACR, 28 April 1996

AAIB Bulletin No: 8/96 Ref: EW/C96/4/12 Category: 1.1

Aircraft Type and Registration: Airbus A320-212, G-DACR

No & Type of Engines: 2 CFM56-5A3 turbofan engines

Year of Manufacture: 1992

Date & Time (UTC): 28 April 1996 at 1345 hrs

Location: West abeam Chateaudun VOR, France

Type of Flight: Public Transport

Persons on Board: Crew - 7 Passengers - 180

Injuries: Crew - None Passengers - None

Nature of Damage: Commander's windscreen cracked

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: N/K

Commander's Flying Experience: 10,425 hours (of which 167were on type)

Last 90 days - 98 hours

Last 28 days - 39 hours

Information Source: AAIB Field Investigation

The aircraft was operating a flight from Birmingham to Malaga. Whilst in cruise flight in clear smooth air at Flight Level (FL)330, Mach 0.78, the Commander's windscreen cracked, with multiplecracks around three sides. At about the same time, the ECAM amberwarning 'ANTI-ICE L WINDSHIELD' appeared. The cabin pressurisationsystem remained normal throughout. The commander could not becertain which layers of laminate were cracked so he initiateda PAN call to ATC, advised them of the problem and requested aslow descent to FL100, which was carried out.

The aircraft had sufficient fuel onboard to enable a diversionto London Gatwick Airport, where the aircraft landed uneventfullyat 1441 hrs. The weather conditions remained good throughoutwith no icing conditions encountered.

The manufacturer's Flight Crew Operating Manual (FCOM) containedan "Abnormal & Emergency" Procedure for such anevent. This indicated that in the event of a cracked window,"the

maximum Flight Level is restricted to FL230 to obtain5 psi differential without excessive cabin altitude and resultantEXCESS CABIN ALT warning". This section of the FCOM wasnot consulted by the crew for the descent.

Examination of the windscreen

Examination of the windscreen revealed that foreign object damage(FOD) was present on the rear lower edge on the outer surfaceof the outer glass pane (figure 1) and had occurred prior to theincident flight. There was no evidence that the FOD had causedoverheating or arcing in the underlying electrical junction betweenthe windscreen heating conductor film and the busbar. Cracks inthe outer glass pane had progressed from the FOD both forwardand rearward along the bottom edge of the windscreen. The crackthat ran forward from the FOD exhibited extensive crazing, overheatingand arc damage. This damage was most severe in the area that wasadjacent to the FOD and was a result of the crack causing delaminationand local disturbance in the electrical continuity between thebusbar and the conducting film. Where the rearward running crackran close to the overheating discolouration in the bottom right-handcorner of the windscreen, crazing due to electrical arcing hadalso occurred. From the ends of both the forward and rearwardrunning cracks numerous cracks fanned out and ran almost rightaround the outer pane of the windscreen.

Two areas of discolouration damage to the windscreen were notedwhen the aircraft was received by the operator in February 1996(figure 1) but the examination concluded that these damaged areasdid not contribute to the damage investigated.

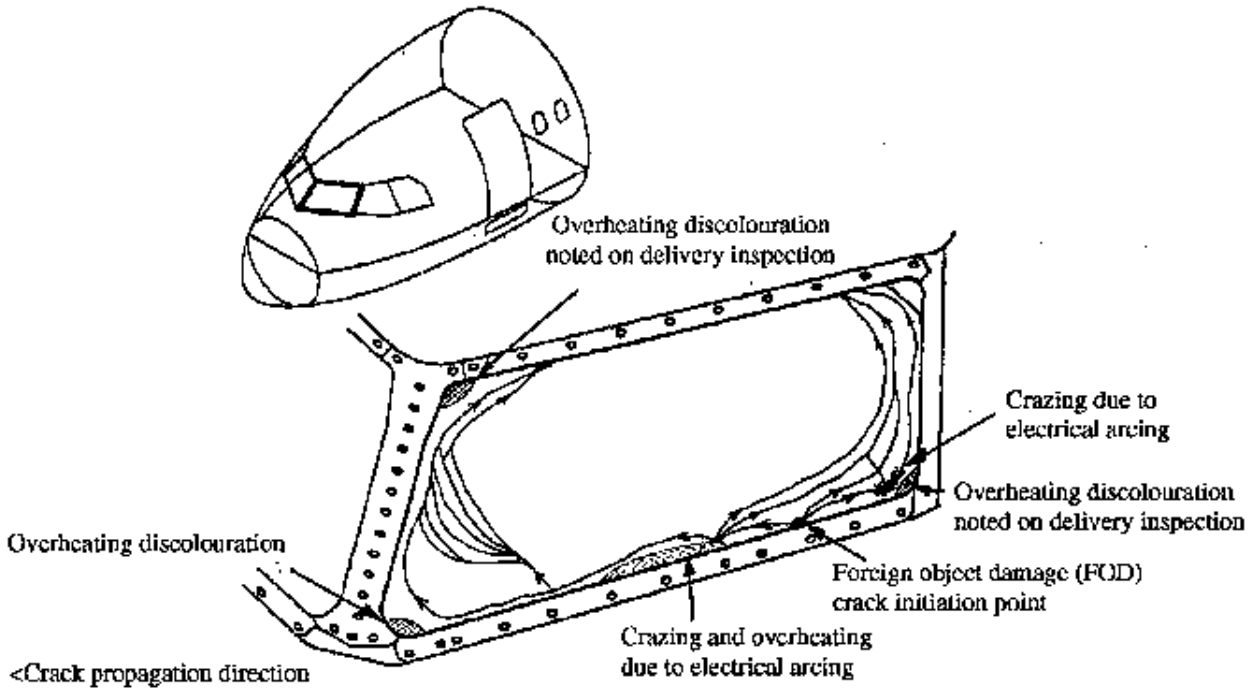

Figure 1 Damage to the windscreen

Adapted from an Airbus Industries drawing