

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Airbus A319-131, G-EUOE
<b>No &amp; Type of Engines:</b>	2 x IAE V2522-A5 turbofan engines
<b>Year of Manufacture:</b>	2001 (Serial No 1574)
<b>Date &amp; Time (UTC):</b>	24 May 2013 at 0716 hrs
<b>Location:</b>	London Heathrow Airport
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)
<b>Persons on Board:</b>	Crew - 5                      Passengers - 75
<b>Injuries:</b>	Crew - None                      Passengers - None
<b>Nature of Damage:</b>	Fire damage to the right engine; mechanical damage to: fuel and hydraulic pipes, slats, flaps, horizontal stabiliser, landing gear and fuselage skin
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence
<b>Commander's Age:</b>	50 years
<b>Commander's Flying Experience</b>	14,337 hours (of which 8,036 were on type)
<b>Information Source:</b>	AAIB Field Investigation

**Notification**

At 0836 hrs local on 24 May 2013, the Air Accidents Investigation Branch (AAIB) was notified of an occurrence involving an Airbus A319 departing from London Heathrow Airport. An investigation was commenced immediately and a team of AAIB Inspectors was deployed. In accordance with the provisions of Annex 13 to the Convention on International Civil Aviation, Accredited Representatives from the Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile (BEA) in France and the National Transportation Safety Board (NTSB) in the USA were invited to participate in the investigation.

**Synopsis**

As the aircraft departed Runway 27L at London Heathrow Airport, the fan cowl doors from both engines detached, puncturing a fuel pipe on the right engine and damaging the airframe, and some aircraft systems. The flight crew elected to return to Heathrow. On the approach to land an external fire developed on the right engine. The left engine continued to perform normally throughout the flight. The right engine was shut down and the aircraft landed safely and was brought to a stop on Runway 27R. The emergency services quickly attended and extinguished the fire in the right engine. The passengers and crew evacuated the aircraft via the escape slides, without injury.

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This Special Bulletin contains facts which have been determined up to the time of issue. It is published to inform the aviation industry and the public of the general circumstances of accidents and serious incidents and should be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

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Subsequent investigation revealed that the fan cowl doors on both engines were left unlatched during maintenance and this was not identified prior to aircraft departure.

### **History of the flight**

The aircraft was scheduled to operate from London Heathrow to Oslo. This was the first flight following overnight maintenance. Nothing unusual was noted during the pre-flight preparations.

The pilots reported that the takeoff from Runway 27L seemed normal, although the commander commented that on rotation he felt a slight bump, which he believed to be a wheel running over a runway centreline light. Early in the climbout ATC informed the crew that their aircraft had left debris on the runway. The flight crew were later advised by the cabin crew that panels were missing from the engines.

As the fan cowl doors detached they caused secondary damage to the airframe and aircraft systems. The symptoms seen by the flight crew included: engine thrust control degradation, the loss of the yellow hydraulic system, and a significant fuel leak. After the loss of the yellow hydraulic system the crew declared a PAN, with the intention of returning to Heathrow once they had fully assessed the situation. ATC provided radar vectors for the ILS to Runway 27R.

During the approach to land, an external fire developed on the right engine. An engine fire warning on the flight deck prompted the crew to declare a MAYDAY. Although both engine fire extinguisher bottles were discharged and the right engine was shut down, the fire was not completely extinguished. The left engine continued to perform normally throughout the flight.

The aircraft landed safely and was brought to a stop on Runway 27R at Heathrow. The airport fire service attended and quickly extinguished a small fire on the right engine. The passengers and crew evacuated via the escape slides on the left side of the aircraft, without injury.

### **Aircraft damage**

Examination of the aircraft revealed that the inboard and outboard fan cowl doors from both engines had detached. Remnants of the doors were recovered from Runway 27L.

The detached fan cowl doors had struck and damaged the inboard leading edge slats, left and right fuselage skin close to the wing roots, overwing fairings, inboard flaps and left belly fairing. In addition, the right engine outboard fan cowl had struck the right wing leading edge at the outboard end of Slat 3, damaging this slat and the inboard end of Slat 4. The outboard flap track fairing on the right wing was punctured and the left horizontal stabiliser leading edge and lower skin were damaged.

Debris had also struck the left main landing gear, damaging the leading edge of the landing gear door and a hydraulic brake pipe.

The right main landing gear outer tyre was damaged during the landing and had fully deflated.

The right engine was extensively fire damaged. The damage was concentrated in the left and right thrust reverser 'C' ducts and common nozzle assembly. A low pressure fuel pipe was punctured by the remnant of the inboard fan cowl that remained attached to engine. The source of ignition that led to the in-flight fire is still under investigation.

### Fan cowl description

The engine fan cowling is composed of two semi-circular composite fan cowl doors. The doors are fastened by four latches attached to the lower edge of the right door. Each latch operates a hook that engages with an eye bolt on the lower edge of the left door. Due to the low ground clearance of the nacelle, fastening the fan cowl door latches usually requires maintenance personnel to lie on the ground to access the latches. The fan cowl door latches are difficult to see unless crouched down so that the bottom of the engine is clearly visible.

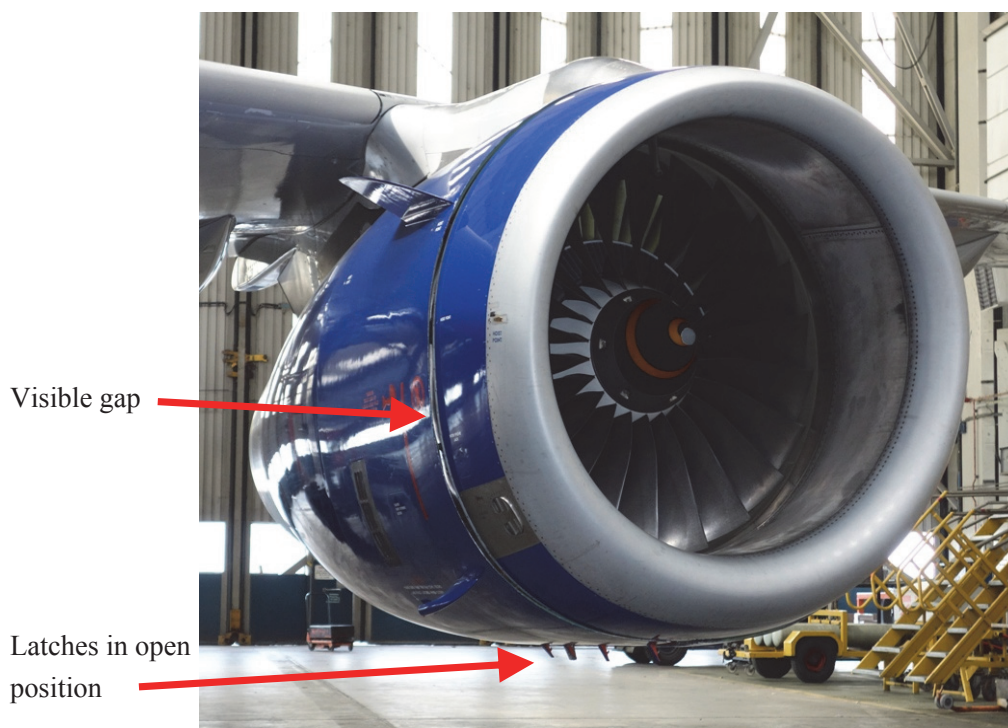
The fan cowl doors can be propped open by two stays mounted on the inside of each door, to allow access for servicing. When the doors are lowered from the propped-open position, a 'hold open' device on the bottom of the fixed engine inlet cowl prevents the fan

cowl doors from closing fully under gravity. In this condition the fan cowl doors stand slightly proud of the nacelle (Figure 1), to provide a visual cue that the doors are not latched.

### Additional information

Following the event photographs of the aircraft, taken prior to pushback, were provided to the AAIB. These photographs show the fan cowl doors unlatched on both engines.

The aircraft had undergone scheduled maintenance overnight. This required opening the fan cowl doors on both engines to check the Integrated Drive Generator (IDG) oil levels.



**Figure 1**

Generic photograph showing fan cowl doors in the unlatched condition

## Safety information

Following previous events of fan cowl door separation on A320-family aircraft, Airbus recommended that operators strictly adhere to Aircraft Maintenance Manual (AMM) task 71-13-00 for proper latching and closing of fan cowl doors after each maintenance action requiring cowl opening.

The Airbus A320-family Flight Crew Operating Manual (FCOM) Standard Operating Procedure (SOP) PRO-NOR-SOP-05 for the exterior walk-around includes a check on each engine that the fan cowl doors are closed and latched. To perform this check it is necessary to crouch down so that the latches are visible.

The Airbus '*Safety First*' magazine, Issue 14 dated July 2012, contains an article relating to the prevention of fan cowl door loss. At that time there had been 32 reported fan cowl door detachment events, 80% of

which had occurred during the takeoff phase of flight. On some occasions significant damage was caused to the aircraft, however, none of these events had resulted in a subsequent engine fire.

This event has shown that the consequences of fan cowl door detachment are unpredictable and can present a greater risk to flight safety than previously experienced.

The following Safety Recommendation is therefore made:

### **Safety Recommendation 2013-011**

It is recommended that Airbus formally notifies operators of A320-family aircraft of the fan cowl door loss event on A319 G-EUOE on 24 May 2013, and reiterates the importance of verifying that the fan cowl doors are latched prior to flight by visually checking the position of the latches.

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AAIB investigations are conducted in accordance with Annex 13 to the ICAO Convention on International Civil Aviation, EU Regulation No 996/2010 and The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996.

The sole objective of the investigation of an accident or incident under these Regulations is the prevention of future accidents and incidents. It is not the purpose of such an investigation to apportion blame or liability.

Accordingly, it is inappropriate that AAIB reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

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