

BAC One Eleven 401AK, G-BBME

AAIB Bulletin No: 3/97 Ref: EW/G96/10/14 Category: 1.1

Aircraft Type and Registration:	BAC One Eleven 401AK, G-BBME
No & Type of Engines:	2 Rolls-Royce Spey 511-14 turbofan engines
Year of Manufacture:	1967
Date & Time (UTC):	23 October 1996 at 0530 hrs
Location:	Birmingham International Airport
Type of Flight:	Public Transport
Persons on Board:	Crew - 5 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Slight scorching to lower part of rudder
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	56 years
Commander's Flying Experience:	19,287 hours (of which 3,150 were on type) Last 90 days - 190 hours Last 28 days - 64 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was on the ramp with the flight crew on board, preparing for service. The first officer had flown the aircraft the previous day and at that time the Auxiliary Power Unit (APU) had been designated unserviceable.

In reviewing the Technical Log, the commander noted that the APU had now been entered as serviceable but to be used for engine starts only; he decided to start the APU, therefore, to check its performance. The first officer initiated the APU start cycle, which is largely automatic, but the process was interrupted when the ground engineer ran up the steps and requested that they shutdown the APU as it was making very odd noises. The crew cancelled the start sequence and the ground engineer then reported that flames had been seen coming from the APU exhaust and that it was smoking. The first officer performed the fire drill, firing the dedicated single shot extinguisher and requested Birmingham Ground Control for the attendance of the Fire services. The airport fire service attended rapidly, by which time there was no sign of fire but the APU exhaust was still smoking.

The APU was removed from the aircraft and sent to a separate maintenance agency for examination and repair. This examination showed no evidence of fire around the APU although there was some evidence of interior sooting; however, this sooting had only occurred within the 'hot section' (combustion chamber and turbine) and had not extended upstream into the impeller, or compressor, section. There was also evidence of corrosion-related air leakage around the joint between the plenum and diffuser casing.

After reassembly, the APU was tested in a dedicated test cell. The test run was unsatisfactory and it was found that the Fuel Control Unit (FCU) fitted was unserviceable, causing surging, making the APU difficult to start and possibly causing overfueling. The FCU incorporates a simple governor and the defects would explain the symptoms seen in the incident on board G-BBME.