

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	Boeing 767-322, N642UA	
<b>No &amp; Type of Engines:</b>	2 Pratt & Whitney PW-606R turbofan engines	
<b>Year of Manufacture:</b>	1991	
<b>Date &amp; Time (UTC):</b>	12 July 2016 at 0729 hrs	
<b>Location:</b>	En route Heathrow to Chicago	
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)	
<b>Persons on Board:</b>	Crew - 11	Passengers - 120
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence	
<b>Commander's Age:</b>	59 years	
<b>Commander's Flying Experience:</b>	13,332 hours (of which 2,790 were on type) Last 90 days - 159 hours Last 28 days - 38 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further inquiries by the AAIB	

**Synopsis**

The flight crew were advised that a fuel leak had been observed from the right over-wing fuel filler cap. The crew declared an emergency and diverted to Edinburgh, where the aircraft landed uneventfully. The fuel filler cap was replaced and the aircraft departed Edinburgh the following day, but during the climb a fuel leak was once again observed from the same location on the right wing. The aircraft returned to Edinburgh, where further maintenance investigation revealed a damaged O-ring in the over-wing fuelling port as the cause of the fuel leak.

**History of the flight**

The aircraft was operating a scheduled passenger flight from London Heathrow Airport to Chicago O'Hare Airport, when approximately 35 minutes into the flight, the flight crew were notified that a passenger had observed a fuel leak on the right wing. The flight crew confirmed the leak was coming from the over-wing fuel filler cap. They declared a MAYDAY and elected to divert to Edinburgh Airport, coordinating with Air Traffic Control to dump fuel in order to reduce the aircraft weight to below the maximum landing weight. The subsequent landing at Edinburgh was uneventful. The Airport Rescue Fire Fighting Service (ARFFS) was in attendance and evaluated the right wing and right engine area after landing. The aircraft was subsequently towed to a remote parking stand where the passengers and crew disembarked normally.

Maintenance engineers at Edinburgh replaced the over-wing fuel filler cap after which the fuel tank was fuelled to maximum capacity; no leaks were observed. The aircraft was then allowed to sit overnight in this condition and no further leaks were observed.

The following day, the aircraft departed Edinburgh on a ferry flight to Chicago. The same flight crew and flight attendants were assigned to the flight, but there were no passengers on board. During the climb-out from Edinburgh flight attendants again observed fuel streaming from the over-wing fuel filler cap on the right wing. The flight crew declared a MAYDAY and returned to Edinburgh. Fuel dumping was not necessary on this occasion as the aircraft was already below the maximum landing weight. The landing at Edinburgh was uneventful and following evaluation by the ARFFS, the aircraft was towed to a remote parking stand where further maintenance investigation revealed that an O-ring in the over-wing fuelling port was damaged (Figure 1).



**Figure 1**

Damaged O-ring from over-wing fuelling port

### **Background information**

The aircraft maintenance records showed that the last heavy maintenance check was accomplished in June 2015, but there was no reference to maintenance having been performed on the over-wing fuelling port at that time, nor since.

### **Comment**

The damage to the O-ring indicates that it may have been pinched or improperly seated when it was last installed. There was no record of recent maintenance to the over-wing fuelling port which may have precipitated this damage. It is likely that once damaged, the condition of the O-ring degraded over time to the point where it was no longer able to form an effective seal between the fuelling port and the fuel filler cap, leading to the fuel leaks described in this incident.