

SERIOUS INCIDENT

Aircraft Type and Registration:	Hawker Hunter T7, G-VETA	
No & Type of Engines:	1 Rolls Royce Avon Mk 122 turbojet engine	
Year of Manufacture:	1958 (Serial no: 41H-693751)	
Date & Time (UTC):	16 September 2012 at 1151 hrs	
Location:	Cotswold Airport (Kemble), Gloucestershire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Under-wing fuel drop tank damaged	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	48 years	
Commander's Flying Experience:	12,985 hours (of which 25 were on type) Last 90 days - 185 hours Last 28 days - 65 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft's left inboard fuel drop tank detached during landing. A technical investigation by the aircraft operator established that insufficient clearances and free play within the tank release mechanism created a situation whereby the drop tank could detach with a relatively small externally applied force.

History of the flight

During the landing rollout on Runway 26, the pilot was advised by ATC that something had dropped from his aircraft. There were no adverse handling effects, and ATC subsequently advised that it was believed to be a fuel drop tank which had detached. The aircraft was taxied to parking, accompanied by a fire tender. No fuel leaks were apparent.

The left inboard drop tank had detached, with no damage to the airframe. The pilot reported that the drop tanks had been partially filled at departure, all in-flight fuel indications were normal, and the drop tanks had emptied well before the aircraft returned for what was described as a gentle landing.

Technical investigation

The aircraft operating company conducted an internal investigation into the incident. The drop tank is held in place by an electro-mechanical release unit (EMRU), whose jaws close around a lug on the top of the drop tank to hold it in place. A jettison system test was carried out, which the EMRU passed. However, when the weight used for the test was shaken severely and forward

pressure was applied, the jaws of the EMRU released the weight. This effect was repeated several times. The EMRU from the right side was substituted for the suspect unit, but the fault reoccurred. When the left EMRU was fitted to the right side, the fault did not occur, thus ruling out the EMRU as the source of the problem.

The investigation then turned to the left pylon fusing and release housing (FRH), which contains the EMRU. It was found that there was insufficient clearance between the manual release and reset plungers and the top of the FRH casing. It was also noted that the release plunger did not have very much free play and travel before it actuated the internal latching mechanism. There was a notable difference between the left and right FRHs in these respects, and tests on several spare FRHs found the free play and travel to be consistently greater than those of the FRH installed on the aircraft's left pylon.

A replacement FRH was fitted and the pylon reassembled using the original EMRU. The release system was then tested and found to be working normally. The investigation concluded that the uncommanded release of the drop tank had occurred due to a combination of the inadequate clearance and free play, which acted to produce a 'hair trigger'. This then required only a slight jolt on landing to cause the mechanical release of the FRH internal latching mechanism and drop tank release.

Previous occurrence

On 18 October 2008, a Hunter F6A was involved in a similar incident, in which the left drop tank also detached on landing (AAIB reference EW/C2008/10/14). Tests on that occasion did not reveal any faults with the tank jettison system, and it was presumed that the force on the EMRU jaws imparted at the moment of landing had been sufficient to cause them to open sufficiently to release the tank.

The AAIB report into the incident observed that Swiss registered Hunters were equipped with a clamp lock around the jaws of the inboard EMRUs to prevent them from opening. This prevented the inboard drop tanks from being jettisoned, either deliberately or inadvertently. However, the report also noted that the Hunter was accepted on to the UK register under a Permit-to-Fly based on an aircraft standard that did not include the Swiss modification. Thus, the modification was not cleared for use on UK aircraft. The position of the UK CAA was that the safety record of the aircraft standard as cleared for flight did not give grounds for concern.

Advice on jettisoning fuel tanks

Civil Aviation Publication (CAP) 632 details the terms under which ex-military aircraft can be operated on the UK register under a Permit-to-fly. It states that:

'drop tanks should only be jettisoned as a last resort and when their retention would imperil the aircraft and crew and bring increased risk to persons on the ground'. It also states that 'pilots should be aware that empty drop tanks have a negligible effect on gliding or range performance of jet aircraft. Therefore, consideration should be given to retaining them in the event of forced landing.'

Safety action

The aircraft operator consulted other operators of Hawker Hunter aircraft (including a military test pilot current on type), as well as original aircraft documentation. Considering also the published advice from the CAA concerning drop tanks, and the in-service experience of the Swiss modification, the operator concluded that it would be desirable to disarm the inboard drop tank jettison system (the outboard drop tank jettison

systems may not be disarmed due to aircraft operating limitations).

The aircraft operator has expressed an intention to consult the UK CAA with a view to obtaining approval for a modification to allow the inboard fuel drop

tank jettison system to be inhibited. The proposed modification would entail electrical and mechanical isolation of the system, together with a mechanical lock the same as, or similar to, that used on Swiss Hunters.