

Shorts 360, EI-CPR

AAIB Bulletin No: 6/99 Ref: EW/G99/03/04 Category: 1.1

Aircraft Type and Registration: Shorts 360, EI-CPR

No & Type of Engines: 2 PT6A 65AR turboprop engines

Year of Manufacture: 1987

Date & Time (UTC): 8 March 1999 at 0850 hrs

Location: Ronaldsway Airport, Isle of Man

Type of Flight: Public Transport

Persons on Board: Crew - 3 - Passengers - 25

Injuries: Crew - None - Passengers - None

Nature of Damage: None

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: 55 years

Commander's Flying Experience: 13,150 hours (of which 1,800 were on type)

 Last 90 days - 109 hours

 Last 28 days - 31 hours

Information Source: Aircraft Accident Report Form submitted by the pilot

The aircraft departed from Stand No 2 at Ronaldsway Airport and taxied towards Runway 26 via the apron and the Northern Taxiway. Entering the taxiway necessitated a turn to the right, however the aircraft did not respond to the associated right turn demand, despite having previously carried out three 90° turns during taxiing. The commander therefore applied the wheel brakes, but there was no response and the aircraft then departed the taxiway onto the grass. The first officer then also applied the brakes, but again there was no response. The commander then attempted to slow the aircraft by selecting reverse pitch on the propellers, however this had limited effect due to the flying control gust locks still being engaged, since this system imposes a baulk on the power levers which limits the engine power. The propellers were then feathered but as the aircraft approached an apron area on the far side of the grass, limited braking and steering returned. The aircraft came to a halt on the edge of the grass.

When subsequently examined by an engineer, it was found that there was no gas pressure in the hydraulic fluid reservoir. This component, which is located aft of the wing spar, consists of a cylindrical container which has a piston that separates the hydraulic fluid from the pressurising nitrogen. This gas pressure ensures that a positive head of fluid pressure is supplied to the engine

driven hydraulic pumps, thus avoiding the possibility of cavitation. The reservoir gas pressure gauge is located in the left main landing gear sponson and the engineer, suspecting that the pipework leading to the gauge may have been the source of a leak, by-passed this line by relocating the gauge to a point near the reservoir itself. A Deferred Defect was raised in the aircraft Technical Log and associated rectification was carried forward to the next 'C' check, which was performed at Exeter Airport five days later. During this rectification work, a crack was found in the flared end of a pipe within a union in the gas pressure indicating pipe, in a concealed area where the pipe was routed behind the cabin trim. This pipe was repaired and the hydraulic fluid was changed as a precaution, since a sample of the fluid was found to be 'milky' in appearance, suggesting possible moisture absorption, or aeration of the fluid. The maintenance organisation considered that pump cavitation, due to the lack of reservoir gas pressure, may have been responsible for the loss of brakes and steering. The emergency brake system (which can be selected from a lever on the left of the control pedestal) has its own accumulator and therefore would not have been affected by the above defect, but it was not selected during the incident.

Two days after this incident at Ronaldsway Airport (ie before the 'C' check), the aircraft was landing at Dublin when the brakes apparently 'came on by themselves' after the aircraft had turned off the runway. Subsequent investigation found that a cable attached to the parking brake control unit was out of adjustment. It has been shown that excessive reservoir gas pressure (ie above approximately 80 psi) can cause the brakes to 'drag' on this type of aircraft. However after rectification of the pipe leak, the accumulator pressure had been checked daily and was found to be holding steady at approximately 45 psi. The operator therefore considered the two incidents to be unrelated.