



MINISTRY OF DEFENCE
MILITARY AIRCRAFT ACCIDENT SUMMARY

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE JAGUAR GR3
XZ381

AIRCRAFT: **RAF JAGUAR GR3 XZ381**

DATE: **20 October 1999**

LOCATION: **10 nm North of RAF**
Lossiemouth

PARENT UNIT: **RAF Lossiemouth**

CREW: **One - Pilot**

CASUALTIES: **One Major**



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Issued by: Directorate of Air Staff, Ministry of Defence, Whitehall, London SW1A 2HB

SYNOPSIS

1. On the afternoon of 20 October 1999, during a routine low level training sortie, the pilot of Jaguar XZ381 experienced a loss of pressure in the aircraft's number two hydraulic control system. As the pilot attempted to return to RAF Lossiemouth, the hydraulic pressure in the number one system also fell to zero, and the Jaguar's flying controls froze. Unable to control the aircraft, the pilot ejected, sustaining major injuries. The aircraft crashed into the sea 10nm north of Lossiemouth and was destroyed.

2. The Board of Inquiry found that the accident was caused by a fluid leak in the hydraulic control system, combined with a cross connection of the left and right hydraulic system return pipes which had effectively converted the two hydraulic systems into one.

BACKGROUND

3. The Jaguar is equipped with two independent hydraulic systems pressurised by pumps fitted to each engine. In the event of a complete loss of one system, the other is designed to supply hydraulic power to all powered flying control units to enable an aircraft to recover safely. XZ381's right spoiler powered flying control unit and hydraulic pipework, which had previously been removed to allow repair work to be carried out, was replaced 2 days prior to the accident.

CIRCUMSTANCES

4. Jaguar XZ381 was conducting a low-level training sortie from RAF Lossiemouth when, on approaching the town of Roybridge, the pilot experienced a loss of hydraulic pressure in the number two system. As a precaution, he attempted to return XZ381 to RAF Lossiemouth and carried out the single hydraulic failure drill. At this stage, the pilot was in full control of his aircraft. On the approach to the airfield the pilot observed that the aircraft's number one hydraulic pressure was also falling, and he therefore turned the aircraft out to sea and declared an emergency. Soon after, as the pressure in the number one system fell to zero, the aircraft's flying controls froze and the pilot ejected, sustaining major injuries.

RESCUE OPERATION

5. A Sea King Search and Rescue helicopter from RAF Lossiemouth was already heading to the area as the pilot ejected. Assisted by a Nimrod, which was on a local training sortie, the pilot was quickly located, picked up by the crew of the Sea King and taken to Raigmore Hospital in Inverness.

INVESTIGATION

7. The Jaguar is not equipped with an Accident Data Recorder, but XZ381's recovered Head Up Display video recording corroborated the pilot's recollection of events. A large proportion of the wreckage was also salvaged and analysed with the assistance of an Inspector from the Aircraft Accident Investigation Branch (AAIB). The AAIB's investigation revealed that the aircraft's number one and number two hydraulic system pipes had been cross-connected. This may have occurred when repairs were carried out to the aircraft a few days before the accident. This in effect had converted the two hydraulic systems into one, losing the protection that the two independent systems normally provide. This in itself would not have led to the loss of the aircraft; however, following examination of the wreckage, the AAIB also found that a hydraulic leak had occurred which had resulted in a total loss of hydraulic fluid. The cross-connection, combined with the leak caused all flying control hydraulic pressure to be lost, which meant the aircraft became unflyable.

SAFETY RECOMMENDATIONS

8. The Board's recommendations included that consideration be given to:
- colour coding the number one and number two system hydraulic pipework to help prevent cross-connection in future; and
 - revising the procedures for priming and bleeding Jaguar hydraulic pumps.