



MINISTRY OF DEFENCE

Military Aircraft Accident Summaries

31/90

9 October 1990

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE TORNADO GR1 ZA468

Date:	20 July 1989
Parent Airfield:	Royal Air Force Laarbruch
Place of Accident:	1.5 nm west of Laarbruch
Crew:	Two
Casualties:	One Major, one slight injury

CIRCUMSTANCES

1. On 20 Jul 89, Tornado GR1 ZA468 had taken-off from RAF Laarbruch, West Germany, when the nose undercarriage failed to retract. The pilot de-selected reheat and reduced power on both engines to avoid exceeding the maximum speed with undercarriage down, and informed Air Traffic Control that he had a minor emergency. On advancing the throttles to maintain speed, there was no response from either engine and both engines remained at flight idle. With a rapidly decaying airspeed and decreasing altitude, the pilot transmitted an emergency call and, after informing his navigator, he initiated command ejection at an altitude of 230 ft. The aircraft crashed in Holland on flat grassland only 41 seconds after take-off; it was destroyed by the ensuing fire.

CAUSE

2. Following the correct handling of a minor undercarriage emergency, the pilot had been faced, at a critical phase of flight, with a complete lack of engine response. Rumbling noises were heard coming from the rear of the aircraft, but there were no associated warning indications in the cockpit. With a rapidly deteriorating situation resulting from a catastrophic loss of thrust, the crew had no option other than to eject.

3. The most probable cause of the accident was that both engines stagnated at idle shortly after a minor take-off emergency.

4. Despite a thorough technical investigation, it was impossible to identify positively the cause of the stagnation which had prevented both engines from accelerating. However, following engine trials, it was considered that the most probable cause of the double stagnation was that both engines had entered a hitherto unknown surge-prone area of the engine performance range. In this area, rapid throttle movements, from reheat to idle and then, a little later, back to reheat, had somehow induced the locked-in surges.

SUBSEQUENT ACTIONS

5. In conjunction with the engine manufacturers, measures are being introduced to reduce the likelihood of similar engine surges on Tornado and an engineering solution is being sought to increase the surge free margins.

CLAIMS

6. Approximately 336,000 Guilders have been paid out in respect of damage caused by this accident.

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