COMMONWEALTH OF AUSTRALIA DEPARTMENT OF TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION SUMMARY REPORT

Publication of this report is authorised by the Secretary under the provisions of Air Navigation Regulations 283 (1)

Reference No. SI/762/1073

1. LOCATION OF OCCURRENCE

	Height a.m.s.l.	Date	Time (Local)	Zone
Near Bankstown Airport, New South Wales	20 feet	9.12.76	1041 hours	ESuT

2. THE AIRCRAFT

Make and Model	Registration	Certificate of Airworthiness
Cessna 320/1	VH-FJW	Valid from 30.5.73

Certificate of Registration issued to	Operator	Degree of damage to aircraft
Jack Brabham Aviation Service Pty. Ltd. Bankstown Airport NEW SOUTH WALES	Jack Brabham Aviation Service Pty. Ltd. Bankstown Airport NEW SOUTH WALES	Destroyed Other property damaged Public recreation shelter

Defects discovered

Port Engine : Capillary unit missing from turbo-charger waste gate actuator.

Starboard Engine : Number One cylinder fuel injection nozzle blocked.

3. THE FLIGHT

Last or intended departure point	Time of departure	Next point of intended landing	Purpose of flight	Class of operation
Bankstown Airport	1038 hours	Bankstown Airport	Test Flight	Private

4. THE CREW

Name	Status	Age	Class of licence	Hours on type	Total hours	Degree of injury
James Schofield SCOTT	Pilot	46	Commercial	6	1804	Fatal

5. OTHER PERSONS (All passengers and persons injured on ground)

Name	Status	Degree of injury	Name	Status	Degree of injury
Dean Rex BOLTON	Passenger	Fatal			

6. RELEVANT EVENTS

The aircraft had recently undergone a major maintenance inspection; it was intended that it then be flight tested prior to returning it to service. The flight was scheduled for 2 December 1976 but, during pre-take-off checks, the port engine did not develop proper power. The pilot, Mr. Scott, deferred the flight.

The fault was considered to be associated with the operation of the port engine turbo-charger waste gate actuator and a replacement unit was obtained through Rex Aviation Sales (NSW) Pty. Ltd. from Normalair Garrett Manufacturing Pty. Ltd. The unit was installed by the operator and, after the engine was 'ground run' to the satisfaction of the Chief Engineer, the aircraft was scheduled for flight test on 9 December 1976. The waste gate assembly was not checked using hydraulic equipment as outlined in the Cessna 320 Service Manual.

On the morning of 9 December the aircraft was boarded by Mr. Scott accompanied by Mr. Bolton who was employed by the operator as an aircraft cleaner and refueller and who was the holder of Student Pilot Licence; he had flown 15 hours. Mr. Scott's pilot licence was endorsed to permit him to fly as pilot in command of Cessna 320/1 aircraft. The endorsement was obtained in July 1968 and his 6 hours experience flying Cessna 320 aircraft was obtained at that time. Subsequently he flew 23 hours in Cessna 310 aircraft, and he flew various Piper twin engined aircraft; none of these aircraft were equipped with turbo-charged engines. His total flying experience in multi-engined aircraft was 408 hours. On 9 October 1976 he completed satisfactorily a Class 1 instrument rating renewal flight check in a Piper PA30 aircraft; this check included a simulated engine failure and single engined flight.

The engines started without difficulty and the aircraft was taxied to the run-up bay for take-off on Runway 29 Right, 872 metres in length. The aircraft remained in the bay for some eight minutes and the port engine was run at high power. Subsequently take-off was commenced at 1038 hours; there was no requirement for the use of the wing flaps and the concensus of evidence is that they were up. Initial acceleration appeared to be normal but the ground roll to lift-off was some 645 metres in lieu of an expected distance of 440 metres.

Short after lift-off a trail of black smoke was observed coming from the port engine. The aircraft yawed and veered to the left in a manner consistent with a substantial unexpected loss of power from the port engine. The take-off heading was then regained. With the landing gear down the aircraft climbed at a slow rate to a height variously estimated as 100 to 250 feet and the r.p.m. of the port propeller appeared to be decreasing.

6. Relevant Events (Cont')

The smoke from the port engine had ceased but a thin trail of black smoke was being emitted from the exhaust of the starboard engine. The aircraft attitude appeared to be normal and the airspeed (as observed from a nearby aircraft) was 100 to 105 knots.

At 1039 hours the pilot transmitted 'Juliet Whiskey emergency' and at this time the aircraft was about 2 km west of the airport. It was generally maintaining the take-off heading and was banked slightly to the left. It was gradually descending, the landing gear was down and the airspeed had decreased to about 100 knots.

When some 3 to 4 km west of the airport at a height of about 100 feet, the aircraft appeared to gain some height and a slightly banked turn to the left was initiated and continued through 180 degrees. Shortly thereafter it was observed at a height of about 80 feet, flying more slowly than previously, banked slightly to the left and possibly yawing to the left. The landing gear was up, the port propeller was feathered and not rotating, and a thin trail of smoke was being emitted from the exhaust of the starboard engine. As the aircraft approached trees adjacent to the airport boundary it was at a height of about 50 feet and it climbed slightly. It then rolled rapidly to the left, passed through trees and struck the ground in a steep nose down attitude. Within seconds it was enveloped in flames.

Weather conditions were : wind light and variable tending westerly, visibility unlimited, cloud one okta 3500 feet, temperature 22° Celsius. The altimeter setting was 1008 mb.

The gross weight of the aircraft at take-off was approximately 2140 kg and the centre of gravity was within the prescribed limits. The 'best rate of climb' indicated airspeed for single engined flight was 102.5 knots; the 'best angle of climb' indicated airspeed was 91 knots; and the 'minimum control' indicated airspeed was 76 knots. It has been calculated that with the port engine closed down and the propeller feathered, and having regard to the power loss resulting from the blocked fuel injection nozzle in the starboard engine, the rate of climb attainable at a speed of 102.5 knots was 150 ft/min provided that the starboard engine was at full throttle and 2600 rpm, the flaps were up, the landing gear was up, and the aircraft was banked 5 degrees to starboard.

The reason for the port engine being closed down by the pilot was not established but the absence of the capillary unit from the waste gate actuator could have resulted in an uncontrollable over-boost situation, engine surging and/or low oil pressure. The power output of the starboard engine was less than normal because the No. 1 cylinder fuel injection nozzle was blocked by flakes of a non-metallic material and small particles of sand, the origin of which was not determined.

7. OPINION AS TO CAUSE

The cause of the accident was that, under stress in a situation where safety margins had been significantly eroded, the recent experience of the pilot in the type of aircraft was not sufficient to enable him to employ the degree of competency required.

Approved for publication	(G.V. Hughes) Delegate of the Secretary	Date 14.8.78