Aviation Safety Investigation Report 198903800

Mooney M20-J

19 August 1989

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Occurrence Number: 198903800 **Occurrence Type:** Accident
Location: Emerald Aerodrome QLD
Date: 19 August 1989 **Time:** 1445
Highest Injury Level: Nil
Injuries:

	Fatal	Serious	Minor	None
Crew	0	0	1	1
Ground	0	0	0	-
Passenger	0	0	0	3
Total	**0**	**0**	**0**	**4**

Aircraft Details: Mooney M20-J
Registration: VH-LGJ
Serial Number: 24-1310
Operation Type: Private
Damage Level: Substantial
Departure Point: Emerald QLD
Departure Time: 1445
Destination: Archerfield QLD

Approved for Release: 13th February 1990

Circumstances:

The pilot reported that, very shortly after liftoff from Runway 15, he heard a loud bang. He was advised by one of the passengers that the baggage door, situated on the upper right side of the fuselage above the wing trailing edge, had opened. Apart from a high noise level, aircraft behaviour seemed unchanged. The pilot said that he recalled a section in the Pilot's Operating Handbook which stated that the flight characteristics of the aircraft would not be affected by an unlatched door in flight. He reassured the passengers to this effect. As the aircraft climbed through about 150 feet, with landing gear still extended and flap still at 15 degres, the pilot reduced engine power to what he thought was about 1800 RPM and turned left to land on the eastern section of Runway 06. He had assessed there was insufficient length of Runway 15 remaining to land straight ahead. As the aircraft turned with 15-20 degrees angle of bank, it was seen to adopt a nose-low/left-wing-low attitude and impact the runway. The pilot reported that the aircraft was in a nose low attitude and close to the ground when it rolled left. He applied right aileron and full power but was unable to prevent the left wing striking the runway surface. The initial impact was 83 metres left of the Runway 15 centreline on a heading of approximately 090 degrees magnetic. The left wing tip contacted the ground first followed by the nose. The aircraft skidded 51 metres before coming to rest. The landing gear collapsed during the impact sequence. Neither the pilot nor any of the passengers reported hearing the stall warning operate prior to impact. The surface wind at the time of the accident was estimated to have been from the south-east at 10-15 knots. There was no significant turbulence. On inspecting the aircraft, the baggage door was still attached to the airframe via its two hinges. The hold-open stay was broken. No fault was found with the door locking mechanism, either through the external locking handle, or the internal lever. The royalite plastic lining, including the protective cover for the internal lever, and insulation material had been torn from the inner face of the door and were found adjacent to the runway. The internal locking knob was securely stowed in the locked position. The pilot reported that it was his habit to check the door as he stepped on to the wing to enter the cockpit. As far as he could recall, the

door was locked prior to the flight. Photographs taken of the aircraft shortly after the accident appear to show the external locking handle in the stowed position. However, it is possible for the handle to be stowed and the locking pins to be located outside the fuselage skin, thus leaving the door unlocked. Because of accident damage, the operation of the stall warning system could not be tested. The pilot could not recall the speed of the aircraft during the turn. It seems probable, in view of the aircraft configuration and the engine power setting, that the airspeed was closer to, rather than substantially higher than, the basic stalling speed of the aircraft. The luggage door is positioned on the upper right side of the fuselage above the wing trailing edge. It is hinged on the top of the fuselage with the hinge line parallel to the aircraft centreline. With the door open, the airflow pattern over the rudder/tailplane could be altered. There is no reference in the Aircraft Flight Manual or the Pilot's Operating Handbook to operations with the baggage door open. However, there is reference in the Operating Handbook to the actions to be taken in the event of the cabin door becoming unlatched in flight (flight characteristics unaffected). It was this that the pilot recalled at the time of the occurence and which led him to reassure his passengers that there was no cause for concern. This knowledge could also have influenced his decision to turn left and land on the remaining section of the other runway.

Significant Factors:

The following factors were considered relevant to the development of the accident

1. The pilot probably did not adequately check the security of the baggage door before flight.

2. The baggage door opened as the aircraft took off.

3. In the subsequent landing, for reason(s) which could not be established positively, the pilot was unable to prevent the left wing from contacting the ground.

Reccomendations:

There have been a number of accidents to M-20 aircraft involving in-flight opening of the baggage door. In at least two cases overseas, the accidents were fatal and involved loss of control at low speed. In a non-fatal accident overseas, airspeed and vertical speed indications became erratic after the baggage door came open and contributed to the pilot stalling the aircraft. In Queensland in 1984, in circumstances strikingly similar to the accident under discussion here, the pilot of an M-20 aircraft was attempting a landing after the baggage door opened shortly on takeoff. He reported that the aircraft "fell away" as it crossed the end of the runway. The aircraft struck the runway surface right wing first, sustaining substantial damage. The pilot did not hear the stall warning sound. These examples indicate that the influence of an open baggage door on the flight characteristics of the Mooney 20 could be significant. Following the first fatal accident, a Service Bulletin dated 28 September 1988 was isued by Mooney Aircraft Corporation (SBM20-239) applying to various serial numbers of M20J Models to prevent in-flight opening of the baggage door. The Bulletin contained instructions to modify the inside latch on the baggage door and was incorporated in Australian Civil Aviation Authority Airworthiness Directive AD/M20/44 dated 23 February 1989. The baggage door inside latch was not a factor in this accident. However, that such modification action to the latch was considered necessary to prevent in-flight opening of the door raises a number of other aspects. These include

1. Whether any warning device (such as a warning light in the cockpit) is necessary to alert the pilot that the door is not locked.

2. Whether any special technique is required during approach and landing to ensure safe control of the aircraft with the baggage door open.

3. Whether any warning should be included in the Aircraft Flight Manual about possible control problems in the event of the baggage door opening during flight.

4. Whether any flight test program is necessary to determine the handling characteristics of the aircraft with the baggage door open. It is recommended that the Civil Aviation Authority examine the above aspects with a view to ensuring the maximum safety level for Mooney 20 operations consistent with practicable economic considerations.