

PART INo. 1

Compagnie Air Liban Languedoc Bloch 161 aircraft swung on take-off at Beyrouth International Airport on 6 January 1954. Directorate of Civil Aviation, Lebanon, Accident Report No. 7

Circumstances

The aircraft using Runway 18 was departing at 0352 on a scheduled flight from Beyrouth to Kweit with 5 crew, 4 passengers and cargo. The aircraft behaved normally on take-off for the first 450 metres until it reached its critical speed (90 mph) when it swerved to the left. The captain took corrective action and the aircraft travelled a further 50 metres parallel to the centre line of the runway and then suddenly swerved to the right. Corrective action to prevent the swing was in vain and the throttles were closed and brakes applied. The aircraft continued to swerve and 70 metres further on, left the runway. The speed at this time was about 50 - 60 mph. After leaving the runway, the aircraft rotated 70° to the left, the left landing gear collapsed and the aircraft burst into flames. The crew and passengers were safely evacuated.

Investigation and Evidence

The investigation considered a number of factors that might have caused the accident, such as unlocked tailwheel, defective rudder trim tabs, defective brakes and failure of the wing flap jacks. These factors were rejected. Evidence showed that when the aircraft reached its critical speed (90 mph) and as it swerved to the left, the flight engineer standing between the pilot's and co-pilot's seats, noticed a reduction in the manifold pressure and engine speed of No. 1 engine. The pressure fell from 48 inches to 42 inches and the engine speed from 2,500 rpm to 2,200 rpm. This sudden reduction caused the flight engineer to look around to check his own station instruments. The readings of both the oil temperature and pressure gauges were normal. Resuming his initial position, he found the manifold pressure and engine speed on No. 1 engine had returned to normal. Meanwhile, the pilot, unaware of the reduction in pressure and engine speed, opened up No. 1 engine and eased back on No. 4 engine at the same time giving right rudder to correct the swing to the left. A sudden picking up of No. 1 engine just as the pilot was counter-acting the left swing, had the effect of sending the aircraft into a swing to the right. In view of the very great inertia of the aircraft and the sharp curve, all the efforts of the pilot to correct this swing proved in vain, and the aircraft ran off the runway.

The cause of failure (and subsequent picking up) of No. 1 engine could not be ascertained due to the damage sustained by the engine. Possibilities could only be considered and these were

- a) air lock in the carburettor or fuel system;
- b) water in the carburettor;
- c) defective carburettor diaphragm.

A test flight was made on 10 January 1954 on a similar aircraft. The test involved two take-offs, one made at 0753 Z and the second at 0805 Z. The tendency of this aircraft to veer to the left was demonstrated during the take-off run. It was further proved that it is very difficult, if not impossible, to control the turning of the aircraft simply by using brake differential and without the assistance of the outer engines. During the take-off, it was necessary to correct the tendency of the aircraft to veer to the left by applying slight pressure to the right rudder pedal. This was also necessary on landing.

Recommendations

1. The procedure followed on take-off was as follows: The co-pilot handled RT communications and was assigned no particular duties unless specifically directed by the pilot-in-command to perform certain functions.

The flight engineer stood between the pilot's and co-pilot's seats. He assisted the pilot in starting the engines and watching the throttle levers to see that they did not slip back. He locked the tail wheel and checked the flight instruments on the pilot's panel. He also was required to look back to check on the readings of the instruments at the flight engineer's station.

The radio operator also had to remain standing without any specific duties leaving the cockpit clear in order not to hamper the movement of the flight engineer. Thus, during both take-off and landing, the flight engineer and the radio operator are standing and are therefore, almost certain to be seriously injured in the event of a crash or if the aircraft overturned.

It was therefore recommended:

a) that the co-pilot be made responsible for the flight engineer's duties in connection with starting the engines, locking the tailwheel, reading the instruments on the pilot's panel and throttling down the engines after take-off;

b) the flight engineer should be in his seat with his safety belt fastened. He should be responsible for checking the instruments at his station and be able to raise the landing gear without rising. He should remain seated until the take-off is completed;

c) the radio operator should remain in his seat with his safety belt fastened until the take-off is completed.

2. The two cargo compartments aft of the passenger cabin and forward of the main door should be eliminated. According to the statements of the stewardess and one of the passengers, the cargo in these compartments had broken the webbing holding it in place, and had spilled into and blocked the passageway, compelling those who were in the cabin to climb or jump over the obstruction. This could have caused such confusion that lives might have been lost, particularly if the number of passengers had been greater.

It was necessary, therefore, to re-locate these compartments forward of the cabin, between the main bulkhead behind the cockpit and the covering of the main spar in the cabin. Furthermore, the webbing should be much stronger or should be replaced by chains.

The space reserved for passengers would extend from the mainspar to the rear. The passageway leading to the main door would thus always be kept clear.

3. It should be possible to close off the compartment behind the cockpit by means of webbing or metal chains in order to prevent the contents spilling out and blocking the exit from the cockpit to the cabin, as happened in this accident. If fire breaks out on the right hand side, the crew members can escape by this door only, and it is, therefore, necessary that it be kept clear at all times.

4. The take-off procedure for the Languedoc should mention the particular tendencies of the aircraft, and specify the action to be taken if the aircraft veers to one side.

The take-off of a Languedoc aircraft which veers either to the right or to the left should never be completed if the speed when it begins to veer is less than 100 miles per hour.

The following suggestion is made regarding the procedure to be applied in such cases:

When a Languedoc aircraft veers to the left or right on take-off at a speed of less than 100 mph, the throttles of all four engines should immediately be completely closed. Immediately thereafter the throttle of the outer engine on the side to which the aircraft is

turning should be opened and then closed again. The brakes should be applied as soon as the speed permits. The aircraft should then return to the end of the runway, carry out run-up procedure, test the engines at full power, and then resume take-off if nothing abnormal is noted.

Probable Cause

The accident was due to a loss of power followed by a sudden picking up of No. 1 engine, added to the inherent tendency of the aircraft to veer to the left. The flight engineer noticed this loss of power but did not warn the pilot before checking the instruments at his own station. Having noticed that his instruments read normally, and finding, on turning back to the pilot's panel, that the engine had picked up, he did not consider it necessary to report the loss of power to the pilot-in-command.

The pilot-in-command must have presumed the swerving of the aircraft to be normal and have corrected the motion of the aircraft on that basis. Owing to the complexity of the flight engineer's duties on take-off and to the fact that he had to stand, thus being subject to inertia and centrifugal forces, he was hampered and delayed in his motions.

The aircraft was destroyed as a result of the fact that, in running over sandy ground, its left wheel sank into a soft spot causing the left attachment fitting of the left landing-gear to break. In collapsing, the landing-gear caused No. 1 and No. 2 engines to come into contact with the ground.

The fuel cocks and the cut-off valves were not closed. Fire broke out on the left wing and destroyed the aircraft.