

Adopted: February 21, 1942

File No. 1365-41

REPORT OF THE CIVIL AERONAUTICS BOARD
of the
Investigation of an Accident Involving Aircraft in
Scheduled Air Carrier Operation

Major damage was received by aircraft NC 25637, a Model 18-08 Lockheed, owned and operated by Continental Air Lines, Inc., in an accident which occurred about 11:23 a.m. April 23, 1941 at the Municipal Airport, El Paso, Texas. No injuries were sustained by any of the three occupants. These consisted of Captain Roger Folwell and Co-Pilot Harry D. Taneyhill, both of whom were properly certificated and appropriately rated, and one passenger, Mr. C. V. Warren.

The flight, designated by the carrier as Flight No. 3 of April 22, was actually operating as a special flight on the following day. It originated at Pueblo, Colorado, from which point it departed at 10:02 a.m. with El Paso, Texas as its destination. Three intermediate stops were scheduled at Las Vegas, Santa Fe and Albuquerque, respectively. The first two scheduled stops were passed up because of weather. The last stop, at Albuquerque, and the departure from there were uneventful. The flight arrived in the vicinity of the El Paso Airport at 11:23 a.m. and received the current local weather report which included unlimited ceiling and visibility with a wind from the southeast of 8 m.p.h.

The approach was started from the northwest end of the field and at a point about two miles away the aircraft was lined up with the northwest-southeast runway, approaching toward the southeast. The landing gear was extended and was checked visually by the flight crew and it was further noted that the usual hydraulic pressure of 600 pounds was indicated. Two green lights came on in the cockpit as an indication that the gear was fully extended. As the aircraft approached the runway, the flaps were extended to a 60-degree position and about 10 inches of manifold pressure was carried on each engine until the aircraft was over the end of the runway at which point the throttles were closed. The aircraft contacted the ground in a seemingly normal tail-high attitude a short distance after passing over the northwest end of the runway. Approximately 75 yards after the main wheels touched the ground the tail wheel made contact. The aircraft continued to roll ahead in a straight line until it was slightly more than half way down the runway, a distance of about 3000 feet, at which point its speed had been reduced to about 15 m.p.h. Then without warning the right landing gear suddenly retracted. The aircraft at once started to turn sharply to the right as the right wing tip and the tips of the right-hand propeller struck the ground. The turn developed into a groundloop and when the total amount of turn was almost 180 degrees, the left landing gear suddenly retracted allowing the propeller blades on that side also to strike the ground. The aircraft then slid for a short distance on the fuselage belly before coming to rest headed in a direction approximately opposite to that in which the approach had been made.

After the accident the aircraft was lifted and transported to a hangar where an inspection of the landing gear and its retracting mechanism was conducted. The inspection revealed a failure of a short section of an aluminum alloy tube in the hydraulic down-pressure line. This tube was found ruptured along a length of about 1 inch and, at a number of points, was swollen due to excessive internal pressure. After this failed tube had been replaced, the landing gear retracting mechanism was operated and functioned normally. Subsequently parts of the mechanism were disassembled and it was discovered that the plunger of the right latch was slightly damaged. The damaged latch assembly and the failed hydraulic tube, as well as a similar undamaged tube, were subsequently submitted by the Civil Aeronautics Board to the National Bureau of Standards for examination and tests. The examination indicated that the damage to the plunger had probably occurred prior to the accident. It is not believed that this damage had contributed to the accident. The examination and tests of the hydraulic tubes indicated that the failed tube had not been defective, but that it had burst as a result of an internal pressure considerably higher than that for which it was designed. It appears that this excessive pressure developed as the weight of the airplane was applied to the unlatched landing gear.

On this model aircraft the electrical signal system of the landing gears consists of green and red lights to indicate the down and up positions respectively. These lights are operated by a contact switch located on the landing gear proper rather than on the latch. Inasmuch as the electrical contact is not directly at the latches, it is possible when the landing gear is out of adjustment, for the green signals to light when the landing gear is in a down position even though the latches are not fully engaged. During the testing of the landing gear after the accident, the electrical signal system was also carefully checked, and found to be adjusted and operating properly.

The condition of the landing gear retracting mechanism and the electrical signal system, as found after the accident, indicates quite clearly that the retraction of the gear was caused by an inadvertent release of the latches during the landing roll. Assuming that the latches were operating properly, and there was no reason to believe otherwise, there is only one possible explanation of the release of the latches at that time, viz., the raising of the landing gear handle in the cockpit. The landing gear handle is located on the left side of a centrally placed panel, and there is a similar handle used to actuate the flaps which is located on the right side of the panel in the same relative position. The landing gear handle is equipped with an automatic locking device operated by means of a solenoid which is wired to the torque arm on the landing gear shock strut. The solenoid is energized when the shock absorber is deflected by the weight of the airplane on the gear. The purpose of the locking device is to eliminate an inadvertent movement of the handle while the airplane is on the ground. Such a system cannot be considered dependable because a shock absorber can stick in the extended position and/or a bad electrical contact can occur.

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Subsequent to the accident, tests on the locking system of the subject aircraft were conducted at the factory in the presence of personnel of the Civil Aeronautics Board. During these tests the system failed to operate satisfactorily in some cases. The possibility of accidental operation of the landing gear handle may have been increased by the fact that the co-pilot made the landing from the left seat, which is customarily occupied by the captain. The cockpit procedure during landing requires the raising of the flaps by the occupant on the right side, and is usually performed when the speed of the airplane has been materially reduced during the landing roll. This leads to a strengthening of the belief that the landing gear handle was inadvertently raised at the time the flap handle would normally be operated. The testimony of the crew, however, does not substantiate this contention.

As a result of this and another very similar accident, the Civil Aeronautics Board recommended to the Civil Aeronautics Administrator on August 28, 1941, that the design of the Lockheed Model 18-08 landing gear retracting mechanism be studied with a view toward its improvement.

PROBABLE CAUSE:

Failure of the landing gear latches to remain in the locked position due to reasons not determined.

BY THE BOARD

/s/ Darwin Charles Brown

Secretary