

In Flight Damage to Structure

Four aircraft had similar inflight damage to their airframe structure. Damage generally more severe on right side of aircraft from flying debris.

United Airlines Flight 811:

NTSB/AAR 92/02

"The primary damage to the airplane consisted of a hole on the right side in the area of the forward lower lobe cargo door, approximately 10 by 15 feet large. The cargo door fuselage cutout lower sill and side frames were intact but the door was missing...An area of fuselage skin measuring about 13 feet lengthwise by 15 feet vertically, and extending from the upper sill of the forward cargo door to the upper deck window belt, had separated from the airplane at a location above the cargo door extending to the upper deck windows. The floor beams adjacent to and inboard of the cargo door area had been fractured and buckled downwards."

"Debris had damaged portions of the right wing, the right horizontal stabilizer, the vertical stabilizer and engines Nos.3 and 4."

"The right wing had sustained impact damage along the leading edge between the No. 3 engine pylon and the No. 17 variable camber leading edge flap. Slight impact damage to the No. 18 leading edge flap was noted."



Air India Flight 182:

Canadian Aviation Safety Board Air India 23 June 1985, and Report of the Court Investigating Accident to Air India Boeing 747, India.

"The examination of the floating wreckage indicates that the right wing root leading edge, the number engine inboard fan cowling, the right inboard midflap leading edge, and the right horizontal stabilizer root leading edge all exhibit damage consistent with objects striking the right wing and stabilizer before water impact." page 49.

"The fan cowls of the number 4 engine show evidence of being struck by a portion of the turbine from number 3 engine." page 49

"The right wing root fillet which faired the leading edge of the wing to the fuselage ahead of the right spar had a vertical dent similar to that which would have resulted had the fillet run into a soft cylindrical object with significant relative velocity." page 30.

Pan Am Flight 103:

UK AAIB Report 2/90

"Of the several large pieces of aircraft wreckage which fell in the town of Lockerbie, one was seen to have the appearance of a ball of fire with a trail of flame. Its final path indicated this was the No 3 engine, which embedded itself in a road in the north-east part of the town." page 31

"Thus, there is little doubt that separation of the forward fuselage was complete within 2 or 3 seconds of the explosion." page 41.

"Structure and contents of the forward fuselage struck the tail surfaces contributing to the destruction of the outboard starboard tailplane and causing substantial damage to the port unit." page 44

"During this process the lower nose section struck the No 3 engine intake causing the engine to detach from its pylon. This fuselage separation was apparently complete within 3 seconds of the explosion." page 44.

"Break-up of the rear fuselage occurred during the vertical descent..." page 44.

"Containers and items of cargo ejected from the fuselage aperture in the forward hold, together with pieces of detached structure, collided with the empennage severing most of the left tailplane, disrupting the outer half of the right tailplane, and damaging the fin leading edge structure." page 57

Trans World Airlines Flight 800:

News Reports from Associated Press, Reuters, major newspapers, press releases from NTSB, FBI

The engines on the right side of the plane both suffered more damage than those on the left, Investigators have said the right side of the Boeing 747, near where the wings meet the fuselage, suffered the most smoke and fire damage. The right inboard engine was relatively intact but suffered "foreign object damage" from debris sucked in while it was apparently still running. A computer simulation of the final moments of Trans World Airlines Flight 800 has placed the blast that downed the plane in a small site on the jet's right side, The New York Times reported Friday. The simulation shows that almost everything in the first spray of metal, luggage and other material blown from the plane came from a confined area above and ahead of the right wing. A safety board official told CNN Friday that investigators found "striking damage" to two seats in Row 23 on the right side of the plane; the two rows behind them -- 24 and 25 -- were missing. The row 26 seats were found. "There's no question that's interesting, but it does not get us to the end game," a federal investigator said. A separate source identified the damaged seats as Nos. 9 and 10, the far right seats nearest the wing and over the center fuel tank. He described the damage as fist-sized holes in the steel-plated back supports. "There are holes in those seats," the source said. But, "there is no conclusion to be drawn from that evidence at this time." Rows 17 to 28 in the coach section of the doomed jetliner have been under intense investigative scrutiny for the past week or so because of fire damage where the passenger cabin meets the right wing. Meanwhile, the mystery of what happened to TWA Flight 800 deepened Monday. Investigators who have examined the center wing box -- the area between the wings -- say it shows fire damage in some areas but not in others, sources told CNN's Carl Rochelle. Some of the fractures in the wing box have soot in them, while others do not, according to the sources. They said the finding suggests that a portion of the Boeing 747

may have broken before it burned in the July 17 explosion that brought down the jetliner. Damage in the center section, where the metal bulges outward in some areas and dips inward in others, further puzzled investigators. Only one of the jumbo jet's three recovered engines shows fire damage, the sources said. Fans on the other two engines were intact when found and were not turning when the engines hit the water, the sources said. They said those two engines hit the water at a relatively "flat" angle, meaning they were moving forward -- not straight down. Two rows of missing seats from the center of the jumbo jet could help pinpoint the location of the explosion that brought down the plane off New York's Long Island, killing all 230 people on board. As recovery efforts in the Atlantic Ocean continue, rows 24 and 25 on the right side of the Boeing 747 are still missing, a source who has seen wreckage recovered so far told CNN. The missing rows are located just a few feet behind the front edge of the right wing, where the wreckage shows the greatest amount of fire damage. In rebuilding the jumbo jet in hopes of finding the cause of the crash, investigators have been concentrating on the midsection, from rows 17 to 28. Referring to the seats in those 12 rows, Robert Francis, vice chairman of the NTSB, said Thursday they were more heavily damaged than other parts of the plane. Two seats on the farthest right side of row 23 had fist-sized holes punched into their sheet metal back supports, sources told CNN Friday. Row 23 is directly in front of the missing rows. Computer simulation Investigators are working with a computer simulation to try to recreate what happened when the plane was blown apart shortly after takeoff from New York's John F. Kennedy International Airport, an NTSB official confirmed. Such a simulation is standard in most crash investigations. Investigators are looking closely at the engines, especially the third engine, which reportedly showed evidence of fire damage. In the Long Island hangar, investigators began tearing apart the No. 3 engine, the only one of the three recovered so far that shows fire damage. It's the engine closest to the fuselage on the right side.

Comment: The distinct crash similarities of aircraft type, radar returns, wreckage plot, sudden short loud sound, abrupt power cut, fodded engines, inflight damage, missing bodies, torn off noses, and start place of damage qualify three aircraft into one class from which the deduction may be made that one unifying cause had the same effects. Another accident with the same similarities except for a torn off nose and less wreckage may also be included in that class. The unifying cause for all four accidents is the inadvertent opening of the forward cargo door inflight. 27 Mar 97

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