

# The Dangers of “Modern” Commercial Aircraft as exemplified by the Concorde Crash

or

## Why aren't plane crashes very survivable?

The Concorde crash epitomizes the problems of aircraft safety in more ways than one. At the root of the problem is ethics and morality; right above that level is aircraft design.

For more than six decades, man has known how to improve aircraft safety and has had the technology to implement that improvement. An article entitled “Crashes CAN be harmless” which appeared in the June 1941 issue of *Mechanix Illustrated*, summed up the solution to aircraft safety better than any other article before or since and can be reduced to three main points:

- Research departments can easily boast that they have developed instruments and gadgets that make crashes entirely avoidable. They can add these things to the pilots' compartment until the walls are cluttered up with them from top to bottom. They can evolve all manner of flapping, fluttering doo-dads that pop out of tails and wings and accomplish some purpose or other. For the most part, these things work quite well, but most

of them need considerable attention from the pilot. ... More gadgets won't necessarily prevent accidents.

- Accidents continue to happen and there's no sense in claiming they can be entirely prevented. The only intelligent thing to do is to build the planes to withstand as violent a crash as possible.
- When the cabin of a plane stays in one piece the passengers stand a chance in any crash. ... Modern cars can roll over, end up on the wheels again, and drive away with pale but unscathed passengers. ... think about it. The designers and engineers must build planes so the pilot and passenger compartment will remain intact above all else in a crash. The present tubular fuselages have frequently demonstrated their fragility at the cost of both passenger and crew fatalities.

*Mechanix Illustrated* left out the isolation of fuel tanks from engines and landing gear but in 1947, the Secretary of the National Fire Protection Association, George Tryon, III, addressed the issue in the *Journal* of the aforementioned association (he is quoted further down).

Nothing has changed, on the contrary:

- Aircraft fuselage structure surrounding passengers is at an all-time low.
- Regulatory agencies and manufacturers continue to focus on accident avoidance instead of accident survivability.
- The number of gadgets, which are installed on, or being considered for installation in conventional aircraft continues to rise, adding weight to aircraft and increasing the pilot workload.
- Finally, take-off and Landing speeds are at an all-time high - the Concorde exemplifying the problem.

In the aftermath of the Concorde crash, *Flight International* of August 1-7, 2000, p. 5, suggests several solutions to informing a pilot that his plane has caught fire. One of these is installation of video cameras so the pilot can see his plane and another suggestion is better communications between the pilot and the tower. Neither is acceptable for neither takes into account the source of the problem: **attaching landing-gear and engines to fuel tank supporting structure in combination with excessive take-off and landing speeds on overstressed tires.**

To give our readers an idea of the dangers of high-speed take-offs and landings and the energy stored in an aircraft tire, here are a few excerpts of the August 7, 2000 issue of *Air Safety Week* ([www.aviationtoday.com](http://www.aviationtoday.com)) which does an excellent job of highlighting the problem:

“Bursting airplane tires are like ‘rubber bombs.’ Under extreme conditions of pressure and heat buildup, an exploding tire can release the energy equivalent of 4-5 sticks of dynamite. The potential for cascading, possibly catastrophic damage to nearby fuel tanks and engines is a well-recognized hazard. The fiery July 25 crash of an Air France Concorde has cast the issue of bursting tires into chilling focus. French officials have said that tire debris from the accident airplane was found on the runway at Paris' Charles de Gaulle International Airport.”

*Air Safety Week* further illustrates the destructive capability of an inflated aircraft tire at standstill by quoting from an article which appeared about 20 years ago in a U.S. Navy publication called *Mech*: “The tire/wheel assembly exploded, tearing the hub into two pieces. One piece bounced off a railing, hitting one helper in the head, killing him instantly. His body was found 10 feet from the spot where he had been standing. The other portion of the hub struck the crew chief with so much force that he was thrown some 30 feet. His head and right arm were severed from his body. All of the wheel bolts were found bent ... and the threads on five bolts were stripped. Only four of the wheel

nuts were found.”

Air Safety Week continues: “The author, Navy materials engineer Marcelo Fontanoz, cautioned that an inflated aircraft tire/wheel assembly needs the cautious handling of ‘an armed bomb.’ “

This case illustrates perfectly why we’ve been making such a big deal about attaching landing-gear to fuel tank supporting structure. With this problem in mind, how would better communications with the tower or even video cameras help in preventing the deaths of dozens or hundreds of people? It doesn’t. It adds weight to the plane or work-load for the pilot (or both) and it gives everyone a false sense of security because everyone is busy. Being busy does not express efficiency.

Almost sixty years ago, *Mechanix Illustrated* reminded us that building a cabin strong enough to survive an impact gives passengers a chance to survive, that adding gadgets doesn’t solve any problems and that it is futile to assume that accidents can be averted.

The Concorde crash could have been foreseen at least as far back as 1947. GEORGE H. TRYON, III, Secretary of the National Fire Protection Association, in the Quarterly of the National Fire Protection Association (Vol 40, No. 4) of April 1947 on page 264 said:

“Moving the landing gear inboard and strengthening the fuselage to absorb the shock of landing would eliminate applying stress to the fuel tank supporting structure. This revision of the common-

place has been accomplished in the Burnelli “lifting wing” design. Another feature of this latter type aircraft is the shifting of fuel tanks so that they are not in direct line with the power plants and their exhaust outlets.”

Whether the crash of the Concorde was caused by an exploding engine, exploding tire or debris puncturing the fuel tanks is irrelevant as in any of these cases, it was the proximity of the landing-gear, fuel-tanks and engines that led to the rapid spread of the fire. It was this combination which allowed the events which led to the horrible loss of life of the Concorde passengers (in this particular case) to occur with such swiftness.

Nevertheless, the real culprits behind the deaths of the Concorde victims and so many others is only indirectly the combination of landing-gear, fuel tanks and engines. It is rather an informal combination of men who would rather do what their superiors tell them because they fear losing their jobs, because they value what they conceive to be a secure and stable job more than the lives of their fellow-men. After-all most of those who die are unknown to most of us. Wasn’t it precisely this facelessness of vic-

tims that allowed those who knew about it to allow so many to perish in so many concentration camps whether in Russia under Stalin, in Cambodia under the Khmer Rouge, in Germany under Hitler, to name only three countries?

The problem we are faced with has been and remains more than one of aircraft safety; we are lacking honesty, integrity and morality in many places of industry and govern-

ment. We may not be able to change others, but we can change the way we act and the way we live. The future always starts now and is dependent on whether we make moral and ethical decisions or not. Those in the aircraft industry / government who have made unethical, immoral, self-interested decisions are to blame for the situation we are facing now, but it isn’t limited to them. Those who have known about Burnelli and have chosen to do nothing because they believe that they are powerless are to blame too. But blame doesn’t achieve anything unless those who are to blame recognize their mistakes and change their ways. Is life only about money or is there more to it than meets the eye? What can I do?

There isn’t a single contribution to the betterment of society that is too small to be valued. Every little bit counts. How are you going to live your life?

Think about it!

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