

THE WORLD'S SAFEST CLASS OF GENERAL AVIATION AIRCRAFT:

By Vaughn Olson

The purpose of this article is to offer some of the reasons why the single engine turboprop is arguably the safest class of aircraft in the world.

“An engine failure related accident in a twin is four times more likely to cause serious or fatal injuries.” (Richard Aarons citing an NTSB report in FAA document FAA-P-8740-25 AFO-800-1079)

In the past twenty-five years in the United States and Canada there have been roughly 350 fatalities in twin engine aircraft due to a loss of power on one engine. This averages approximately 14 fatalities per year in twins.

Since 1985 when the first single engine turboprop went into service, all single engine turboprop aircraft COMBINED have compiled over 10,000,000 (ten million) flight hours with no (that's zero) fatalities in North America due to engine failure.

The reasons for multiple engines on aircraft are simple. In the early years of aviation aircraft engines lacked both power and reliability, thus multiple engines were required to lift high payloads and dependably deliver them to their destinations. The early Dorniers and Sikorskys, followed by B-36's and B-52's and DC-4's, 6's, 7's and Constellations are all cases in point. The trend now in commercial aviation, as engines have become more powerful, reliable and economical, is back to fewer engines. The Boeing 757, 767, 777, 787 and some Airbus Industry aircraft illustrate this. These modern, safe, and efficient aircraft fly global routes, over oceans on two engines, while their immediate predecessor, the 747, used four.

Informed pilots know that tactical aircraft like the Corsairs and Mustangs of WW-II and later A-4's and F-16's can carry a much higher percentage of their gross weights as payload than can their multi-engine bomber counterparts.

Single engine turboprops typically offer not only payload-range capabilities far exceeding those of their twin engine competition, but remarkable efficiency, versatility, simplicity, and more to the point, safety, as well. This is because they are singles and not burdened with the weight, drag, complexity, and vices of twin engines.

What about safety? Remember the “one a day in Tampa Bay” legacy of the Martin B-26 medium bomber of WW-II? The problem occurred when one of its two powerful Pratt & Whitney R-2800 engines failed after takeoff or in the landing pattern (where failures most often occur). The asymmetrical thrust of the operating engine created horrendous yawing and rolling moments. If these were not instantly and instinctively countered by a current, expertly trained airman, the results were disastrous.

The same problems exist today in all twin engine propeller driven aircraft, thus the higher rate of fatal accidents in twins. Even those few with auto-feather and rudder boost are not immune to the laws of aerodynamics, and the incorporation of these features only serves to underscore the inherent danger.

To digress further on the perils of twins; remember, if the pilot is current, well trained, and does everything perfectly upon the failure of an engine after takeoff and succeeds in keeping the aircraft right-side up, many twins, especially at high gross weights, lack sufficient power to climb on one engine and are going in anyhow, under the marginal control and high Vmc of reduced power on one engine.

This is where twin engine propeller driven aircraft really are at a disadvantage. They lack the fuselage structure to protect the occupants that all single engine aircraft turboprop aircraft exhibit.

This structure consists of fuselage longerons as well as additional strong cockpit carry through support structure and a fire wall. All of these are designed to support the weight and torque of a power plant and propeller that is further supported by a strong steel tube engine mount assembly. This sturdy mass around and ahead of the occupants serves to protect them to a very high degree in a forced landing situation, where passengers and crew in a twin have nothing more than fuselage skin around them, some avionics and possibly baggage ahead of them for protection. Think of turboprop singles as Volvos and twin alternatives as old Volkswagen Beetles!

All of this simply means that in the event of an engine-out landing the touchdown speed in turboprop singles is far slower than any twin engine turboprop aircraft in the world with which they can be reasonably compared. This, in combination with their demonstrated record, as attested by FAA, NTSB and Transport Canada statistics, the incredible safety record of the PT-6 engine, and no twin engine vices or weaknesses, yields the safest class of general aviation aircraft in the world.

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- Level 1 Statement of Aerobatic Competency: Solo Aerobatics, Air Combat Maneuvering, Formation Aerobatics, F4U/FG1D, P-51, T6/SNJ, PC-7, P-3, Citabria
- Letter of Authorization, All Types and Makes of High Performance Piston-Powered Aircraft, with Endorsing Authority
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- Former Confederate Air Force Flight Safety Board Member
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