

SECTION 2 - DESCRIPTION AND OPERATION

2.0. AIRFRAME

The P.180 Avanti II is a twin-engine, three-lifting-surfaces (forward wing, main mid-wing, T-tail horizontal stabilizer), pusher propellers, turbine-powered airplane.

The airplane is of mixed aluminum alloy-advanced composite construction. It consists of three major units: the forward fuselage, the aft fuselage with the main wing, and the tail cone with the T-empennage.

The forward and the aft fuselage, mated at the rear pressure bulkhead, are light alloy monocoque structures with riveted stretched skin. The forward fuselage consists of the nose section and the pressurized cabin. The nose section, crossed by the forward wing, houses the avionics compartment and the nose landing gear well. The cabin section is sealed to maintain pressurization and can be arranged with a large variety of optional equipment and furnishings.

A two-piece cabin door is located on the left side of the fuselage just aft of the cockpit. The upper portion is forward side hinged. A latch retains the door when in the open position. The lower portion folds down to provide two steps for easy in-boarding and deplaning passengers. The door locking mechanism consists of seven pins in the upper door and four pins in the lower door, which are actuated by two handles. Observing through inspection windows the correct alignment of suitable indicators, it is possible to ensure if the doors are properly closed and latched. In addition a microswitch for each pin is provided to monitor their correct position: if one or more of the pins are not in the correct position, the red CAB DOOR light on the annunciator panel will flash and if all are released (door open) the light will be steady. The electrical circuit test is automatically activated during the annunciator panel test.

Windows include the windshields, six passenger windows on the left side and seven on the right.

On the right side, the first window aft of the windshield is a combination window/emergency exit which opens inward the cabin when released. A red release handle is provided on both the internal and external side of the emergency window. A safety pin with a "REMOVE BEFORE FLIGHT" red warning flag allows locking the internal handle when the airplane is parked.

The forward wing is a single-piece structure fixed mated to the fuselage. The full span flaps are operated through electrical actuators. The forward wing and related flaps are light alloy with two spar and riveted skin construction.

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The aft fuselage consists of the wing intersection section, just aft of the rear pressure bulkhead, housing the integral fuselage fuel tanks, the fuel collector tanks and the main landing gear wells and of the baggage compartment section housing the environmental control package below the compartment floor.

The top-hinged baggage compartment door is on the left side of the fuselage aft of wing trailing edge. The baggage compartment and landing gear doors are composite material.

The light alloy, cantilever, mid wings are torsion box structures each made of two machined top and bottom panels with integral stiffeners and two machined spars sealed to contain fuel. A third rear spar runs from the engine nacelle to the fuselage centerline. The two wings are mated at fuselage centerline while the three spars are diffusively connected to three fuselage bulkheads. The leading edges are light alloy stretched skin with bonded ribs.

The trailing edges are composite material.

The ailerons are all-metal mass balanced structures.

The main wing flaps are composite construction. The outboard Fowler and the inboard single slotted flaps are electrically controlled by a drive unit through rigid shafts and screwjack actuators. An electronic control unit coordinates motion of the forward and the main wing flaps.

Anti static wicks attached to the trailing edges of wings and tail surfaces are designed to clear the airplane of surface static electricity that might disrupt low frequency reception or cause VHF interference. A total of 16 static wicks are installed: 3 on each wing aileron, 3 on each elevator, 1 on each forward wing flap, 1 on the rudder (lower end) and 1 on the vertical fin tip fairing.

The engine nacelles are composite construction. Each nacelle consists of an upper section with the integral engine air intake, a lower section with the air intakes for engine oil and starter-generator cooling, and an aft section. Each section can be removed to gain access to the engine.

The tail cone with the vertical stabilizer are complete light alloy construction. The rudder is a light alloy construction with two spars and riveted skin structure. The movable horizontal stabilizer is graphite composite construction while the elevators are light alloy structures with one spar and riveted skin. Rudder and elevator are aerodynamically and mass balanced.