
N7310P
CESSNA

PILOT FLIGHT CHECK

Photos by the author

■■ Flight Level 210 is not the most common cruising altitude selected by pilots of single-engine airplanes. Even more unusual, though, is for the occupants of the plane to be whiling away the hours at that level without oxygen masks strapped to their faces.

But as the pressurized Cessna 210 proliferates on the airways, such high-level comfort in a single-engine craft will become more commonplace. High-altitude comfort comes for high-altitude prices; N7310P, flown for this PILOT flight check, was priced at $153,115.

The model we flew is presently the only single-engine pressurized airplane in production. The last attempt at a pressurized single was the Mooney Mustang, which gasped its last breath of thin air in the late 1960s. Through March, Cessna had turned out only six of the P210s. But, according to a company spokesman, the production rate should increase to about 20 a month.

From a distance, the Pressurized Centurion is a twin of its nonairtight brother. Viewed more closely, it calls to mind nautical terminology. The standard Centurion's two elongated side windows are replaced on each side with four squarish portholes. Two other small portholes replace the much larger rear windows on the standard Centurions. The skin of the aircraft in the cabin area, that being a pressure vessel, has more rivets per foot, and the location of the pressure bulkheads is apparent from the double rows of rivets.

Cessna always has touted its high-wing airplanes for their easy access through two doors. The Pressurized 210, to reduce pressure seal requirements, foregoes such convenience. It has only one main cabin door—on the left side. To the right is a half-door that swings upward toward the wing as an emergency exit. There is also a door for access to the baggage compartment, which is aft of the rear pressure bulkhead.

With only one door on the left, the pilot is the last person in, and first out of this craft. So picking up or dropping off a passenger may prove troublesome. On the other hand, the pilot's proximity to the door puts him in control of its latching, a job that needs to be handled properly (though it would seem difficult to inadequately latch the door).

The main door is latched in place with a hard forward shove on a handle that pushes nine locking pins into the door frame. Because you're closing a sealed compartment, the task is eased by sliding the pilot's vent window open before attempting closing of either the

CESSNA's Pressurized Centurion

A high-flying heavyweight from Cessna marks a re-opening of the pressurized-single class

by BERL BRECHNER/AOPA 466558

The P210 can carry a ramp weight of up to 4,016 pounds out to the run-up area. A pod housing the radar antenna hangs from the right wing.

main or emergency door.

Access in and out the main door is accomplished more easily than on standard Centurions—apparently because the front seats may be slid further left for increased leg room while stepping in and moving across.

Once inside, you'll find the front office of this flying machine looks very much like those of other currently built Centurions. Since the engine is turbocharged the manifold pressure gauge has capability for readings higher than most, and there are two other gauges and a knob that relate to the pressurization system. Oh yes, the Bendix RDR 160 weather radar made for a further variation in the panel of a single. This demonstrator also sported a complete set of Cessna radios, plus an integrated flight control system and area navigation. And there was an FM-stereo cassette deck.

To use this airplane comfortably, a pilot unfamiliar with pressure systems will require a good bit of learning time. At present, Cessna has no school for pilots who buy this plane (as it does for purchasers of some of its pressurized twins). But Pat Grasch, a pilot with Cessna's air transportation department, suggested that a two- to three-hour briefing on the aircraft's systems, plus another three-hour in-flight checkup, might be expected for a pilot qualified in the type of aircraft but unfamiliar with pressurization.

Cabin pressurization in the P210 is provided by the turbocharger. And the nuances of the system, including the workings of the pressure controller, outflow and safety valves, dump valve, and pressure differential gauge, should be well understood by the pilot, for reasons both of safety and comfort. At 23,000 feet, the highest altitude this craft is certified for, your airplane is more than an airplane—it's a life support capsule for a hostile environment. Misuse of the craft's controls, or failure to recognize impending problems, can lead to hypoxia or ear damage for the craft's occupants.

Pilots should be especially aware of their fuel supply. Inadvertently running a tank dry will mean more than a temporary power loss; the pressurization goes with it, and an abrupt climb in cabin altitude can be expected. Thus it was a little disconcerting to see that Cessna has moved the fuel gauges from their previous position on the right side of the instrument panel—they're now set almost on the floor near the fuel selector handle. The fuel gauges and several engine gauges had to be shifted to make room for the radar screen installation.

continued

Grasch, in his preflight briefing, stressed the importance of advance planning in use of this aircraft. With ground speed during a descent in the 200- to 220-knot range, the pilot needs to plan his descent to pass through 10,000 feet 30 miles from the destination. So a descent from 18,000 feet might start 80 miles out. Grasch suggests that an altitude of 20,000 would be impractical for most flights unless they are at least 600 miles long.

The pressurization system of the P210 allows for a maximum pressure differential of 3.35 pounds per square inch (psi). So at 10,000 feet, where the outside standard pressure is 10.10 psi, the pressure in the cabin could be as high as 13.45, equivalent to the pressure down near 2,000 feet. If the plane is at 20,000 feet, its cabin can be maintained at a pressure level of 10,000 feet.

A dial on the instrument panel is used to set the altitude you'd like to hold in the cabin. Once that dial is set, the altitude will be held automatically, until the craft climbs above an altitude that causes the pressurization to reach 3.35 psi maximum. Then the cabin starts to climb, but at a rate less than the airplane itself. An inner scale on the altitude select dial shows the altitude at which the maximum differential will be reached. There is a gauge to show the rate of climb or descent in the cabin, and another that shows both the cabin altitude and the pressure differential that exist at any given moment.

Though no 600-mile flight was envisioned, I took the craft up to 20,000 feet. Cabin altitude was set for 2,300 feet. As the craft passed through that level its cabin climb needle went to zero. Then the differential began to increase toward 3.35 psi, which was reached at 10,300 feet. At that point the plane was climbing at 900 to 1,000 fpm, and the cabin began a 700 fpm climb. Together, the cabin and plane climbed to 20,000, where the cabin altitude had reached almost 10,000 feet. Time to altitude from Cessna's 1,384-foot-high field in Wichita was just about 20 minutes.

At that altitude, the Continental engine was set for 79% power, which took 33 inches manifold pressure and 2,500 rpm. The outside temperature was −23°C and the altimeter was set to 29.92 (standard since we were at a flight level). The speed indicator showed 145 knots, which computed to 198 knots true, with fuel consumption at 115 pounds per hour (19.2 gallons per hour). A more conservative power setting was 55%—25 inches manifold pressure and 2,300 rpm—where a speed of 171 knots true was achieved with fuel consumption reduced to 75 pounds per hour (12.5 gph). At the higher power setting, in level flight with moderate tailwinds (for that altitude), the DME showed a modest 244 knots, or 281 mph. At any of the selected power settings, the noise levels inside the P210 are very low, due to the extra structure and thick windows enveloping the craft's occupants.

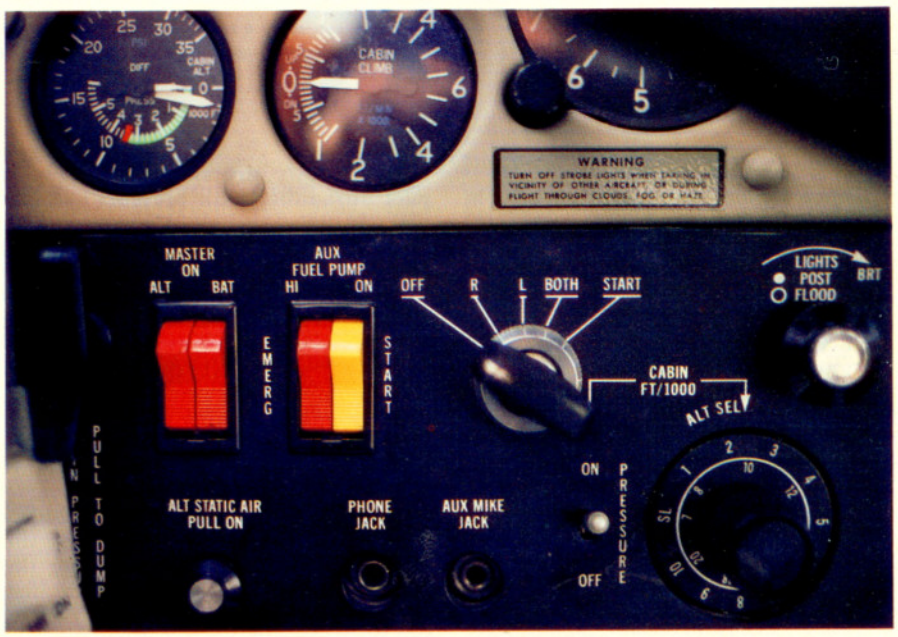
Brief experiments with potential mistakes a pilot could make showed the consequences of mishandling the controls of this craft. Since pressurization depends on operation of the turbocharger, a manifold pressure of not much lower than 20 inches must be held to maintain cabin pressure. A quick rotation of the altitude select dial, or too much of a power reduction, will bring about a discomforting surprise to the ear drums, for cabin response to pressurization change is almost instantaneous. If you quickly rotate the cabin pressure dial from 8,000 to 10,000, your ears will climb 2,000 feet before you can say "two-thousand."

Besides these cabin controls, the pilot needs to stay closely tuned to cabin temperature. A good amount of jockeying of heater and defroster controls is required to adjust for changing temperatures resulting from the rapid climbs and descents this airplane is capable of.

And speaking of rapid descents, the craft's handbook specified emergency letdown procedures, and we gave them a try. First the gear is extended (at an airspeed below 140 knots IAS), and power is pulled back. With flaps remaining up, the craft's nose is lowered to attain speeds up to 200 knots indicated (in smooth air). In this configuration but holding 180 knots, our P210 was dropping earthward from 18,000 feet at a rate of 1,000 feet every 20 seconds.

No adjustment to the pressurization system is necessary for such a descent. However, for any landing the pilot must make sure that the selected cabin altitude is higher than the field elevation at the destination so the airplane does not arrive at the ramp in a pressurized condition.

The emergency descent exercise was ended at 15,000 feet and we continued downward at more normal rates. The overall feel of this aircraft, particularly during takeoff and landing, is that this is not a light airplane. Well, for certain, it's not. The Pressurized Centurion weighs in at 4,016 pounds maximum ramp weight, which puts it in the ring with the heavyweights. In



Cabin altitude and pressure differential are shown on the instrument at left, while climb or descent of the cabin is seen on the other instrument. Pressure selection is done with the knob at lower right, which shows 2,300 feet as the desired cabin altitude.

flight, the plane is readily controllable, however, and the operating speeds for gear (140 knots) and flaps (10 degrees at 150 knots) allow for added maneuverability approaching airfields.

Takeoffs from Cessna field and nearby El Dorado were found to be a little sluggish. With temperatures in the low 40s, a takeoff from Cessna's airport used up almost 1,500 feet of the 3,800-foot strip. There were two of us aboard with full fuel (89 gallons), meaning the plane still had carrying capability for another 540 pounds of people or baggage.

The 210's reputation as an exceptional load carrier has been maintained. The P210's allowable gross weight was raised to more than overcome the weight penalty added by pressurization gear.

The airplane flown for this check, besides all its other equipment, also carried a full complement of deicing equipment, including electric prop heat, boots on the wings and tail leading edges, and a windshield anti-ice plate. However, the plane was not certified for flight in icing conditions. Reportedly, there is still resistance on the part of the FAA to approve a single-engine airplane for flight in icing conditions. And being a single, it lacks some of the system redundancy found in twins.

Nevertheless, this P210 would have to be termed the complete single, for it has all primary features available to any aircraft. With its pressurization, turbocharging, radar, ice protection, extensive avionics, and stereo, there can be only one conclusion about the true identity of this craft. It's a six-seat airliner, with a propeller on the front. □

Porthole-like windows are required for better cabin-sealing capability, but reduce all-around visibility. The half-sized emergency exit on the plane's starboard side at lower left.

The extent of instrumentation on this single is measured by the array on its panel. Besides full avionics, an RDR-160 weather radar fits in at right. Fuel gauges are moved to the base of the center pedestal.

CESSNA P210N

Basic price $94,500

Specifications

Engine	Continental TSIO-520-P 285 hp @ 2,600 rpm (continuous)
Propeller	McCauley CS, 3-blade
Wing span	80-in dia
	36 ft 9 in
Length	28 ft 2 in
Height	9 ft 5 in
Wing area	175 sq ft
Wing loading	22.9 lb/sq ft
Passengers and crew	6
Empty weight	2,345 lb
Useful load	1,671 lb
Gross weight	4,000 lb
Power loading	12.9 lb/hp
Fuel capacity	90 gal (89 usable)
Oil capacity	11 qt
Baggage capacity	200 lb

Performance

Takeoff distance (ground roll)	1,300 ft
Takeoff over 50 ft	2,160 ft
Rate of climb (sea level)	930 fpm
Maximum level speed	204 kt
Normal cruise speed (80% power, 20,000 ft)	196 kt
Economy cruise speed (55% power, 20,000 ft)	158 kt
Range at normal cruise (with 45-min reserve)	815 nm
Maximum range (with 45-min reserve)	960 nm
Certified maximum altitude	23,000 ft
Stall speed—C.A.S. (clean)	67 kt
Stall speed—C.A.S. (gear and flaps down)	58 kt
Landing distance (ground roll)	765 ft
Landing over 50 ft	1,500 ft