Cessna 210

Training Manual

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This Training Manual is intended to supplement information you receive from your flight instructor during your type conversion training, and the information in the approved manufacturer's operating handbook from the aircraft you are flying. While every effort has been made to ensure completeness and accuracy, should any conflict arise between this training manual and other operating handbooks, the approved manufacturer's operating handbook, from on board the aircraft, must be used as a final reference. Information in this document is subject to change without notice and does not represent a commitment on the part of the authors. The authors cannot accept responsibility of any kind from the use of this material.

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Note: ENGLISH SPELLING has been used in this text, which differs slightly from that used by Cessna. Differences in spelling have no bearing on interpretation.

FACTS AT A GLANCE

Common Name: Cessna 210
ICAO Designator: C210
Type: High performance four to six seat light single engine aircraft

Powerplants	
210L	One 225kW (300hp) Continental IO-520-L fuel injected flat six piston engine driving a three blade constant speed McCauley prop.
T210M	One 230kW (310hp) fuel injected and turbocharged TSIO-520-R, driving a constant speed three blade prop.
P210R	One 240kW (325hp) turbocharged and fuel injected TSIO-520-CE.
Performance	
210L	Max speed 324km/h (175kt)
	Max cruising speed 317km/h (171kt)
	Long range cruising speed 249km/h (134kt)
	Initial rate of climb 950ft/min
	Service ceiling 17,300ft
	Max range with reserves 1972km (1065nm)
T210M -	Max speed 380km/h (205kt)
	Max cruising speed 367km/h (198kt)
	Long range cruising speed 260km/h (140kt)
	Initial rate of climb 1030ft/min
	Service ceiling 28,500ft
	Range at long range cruising speed 1455km (785nm)
P210R	Max speed 417km/h (225kt) at 20,000ft
	Max cruising speed 394km/h (213kt) at 23,000ft
	Initial rate of climb 1150ft/min
	Service ceiling 25,000ft
	Range with reserves and optional fuel 2205km (1190nm)
Weights	
210L	Empty 1015kg (2238lb); Max takeoff 1725kg (3800lb)
T210M	Empty 1022kg (2250lb; Max takeoff 1725kg (3800lb
P210R	Empty 1120kg (2470lb); Max takeoff 1860kg (4100lb)

Dimensions	
210	Wing span 11.15m (36ft 9in), length 8.59m (28ft 2in). Wing area 16.3m2 (175.5sq ft)
T210M	Wing span 11.21m (36ft 9in), length 8.59m (28ft 2in), height 2.87m (9ft 5in). Wing area 16.3sqm, (175.5sq ft)
P210R	Wing span 11.84m (38ft 10in), length 8.59m (28ft 2in), height 2.95m (9ft 8in). Wing area 17.2m (185.5sq ft)
Capacity	
Typical seating for four with optional seating for extra two children in some models, or seating for six adults in later versions.	
Production	
Total 210, T210 and P210 production 9240 (including 843 P210s).	

Table of Contents

Introduction

This training manual provides technical and operational descriptions of the Cessna Centurion, Centurion II, and Turbo Centurion aircraft model range.

The information is intended as an instructional aid to assist with conversion and or ab-initio training in conjunction with an approved training organisation and use of the manufacturer's operating handbook. The text is arranged according the progression typically followed during training to allow easier use by students and assimilation with an approved training program. This layout differs from the Pilot's Operating Handbook, which is designed for easy operational use.
This material does not supersede, nor is it meant to substitute any of the

Figure 1a Cessna 210

manufacturer’s operation manuals. The material presented has been prepared from the basic design data obtained in the Pilot’s Operating Handbook, engineering manuals and from operational experience.

History

The Cessna aircraft company has a long and rich history. Founder Clyde Cessna built his first aeroplane in 1911, and taught himself to fly it! He went on to build a number of innovative aeroplanes, including several race and award winning designs.

In 1934, Clyde's nephew, Dwane Wallace, fresh out of college, took over as head of the company. During the depression years Dwane acted as everything from floor sweeper to CEO, even personally flying company planes in air races (several of which he won!). Under Wallace's leadership,

the Cessna Aircraft Company eventually became the most successful general aviation company of all time.

During its production life the Cessna 210 was at the top of Cessna's single engine piston models, positioned between the 182 and the 310 twin in terms of performance. The first flight of the 210 occurred in January 1957. This new aircraft featured, for the first time on a Cessna aircraft, a retractable undercarriage and swept back vertical tail surfaces. The 210 entered production in late 1959, and from that time the type was constantly updated.

Notable early upgrades include the 210B which introduced the wrap around rear windows, the 210D with a more powerful (210kW/285hp) engine which introduced the Centurion name, and the turbocharged T210F. The 210G introduced a new strutless cantilever wing, increased fuel capacity, restyled rear windows and enlarged tail surfaces. Continual development of the 210 and T210 range continued through until production ceased in 1985.

A significant development made possible by the T210, was the pressurised P210 which first appeared in 1978. The pressurisation system meant that the cabin's internal altitude was equivalent to 8000ft when flying at altitudes up to 17,350ft, providing maximum benefit from the turbo engine.

In 1998 Cessna was considering resuming production of the 210, as they have done with the other popular models. At the time of writing no progress has been made on this decision.

Models and Differences

As detailed on the previous page, the Cessna 210 model had a number of type variants during its production history. Additionally there are a number of modifications provided for the airframe, instruments/avionics equipment and electrics.

Speeds often vary between models by a few knots, some more significant type variants have speed differences up to 40kts. Whenever maximum performance is required the speeds will also vary with weight, and density altitude. For simplification the speeds have been provided for the model C210 Centurion most commonly used, converted to knots and rounded up to the nearest 5kts. Generally multiple provision of figures can lead to confusion for memory items and this application is safer for practical uses.

During practical training reference should be made to the flight manual of the aeroplane you will be flying to ensure that the limitations applicable for that aeroplane are adhered to. Likewise when flying different models it should always be remembered that MAUW, flap limitations, engine limitations and speeds may vary from model to model. Before flying different models,

particularly if maximum performance is required, the AFM should be consulted to verify differences.

Model History Table

The following table provides a brief summary of the models by year of manufacture, with descriptions of the major changes.

TYPE	*NAME*	*YEAR*	*MODEL*	*DIFFERENCES*
C210		1960	57001-57575	40 degrees hydraulic flap, wing with strut, 4 seat capacity, 260hp IO-470 engine, maximum gross weight 2900lbs. Battery under aft cargo compartment floor.
C210A		1961	21057576-57840	Battery moved to under pilot seat. Third side window added to rear fueselage.
C210B		1962	21057841-58085	Cabin size increased slightly. Maximum weight increased to 3000lbs. Battery moved to right side of engine compartment behind firewall, where it remains. Hydraulic accumulator (for pressure regulation) removed.
C210C		1963	21058086-58220	Minor hydraulic system improvements.
C210D	Centurion	1964	21058221-58510	Rear child seat added. Electric flap replaces hydraulic. Engine power increased from 260hp to 285hp. Minor improvements on airframe. Maximum weight increased to 3100lbs.
C210E	Centurion	1965	21058511-58715	Alternator replaces generator, vernier throttle removed, and cowls streamlined due to extended prop-shaft.

TYPE	NAME	YEAR	MODEL	DIFFERENCES
C210F T210F	Centurion/ Turbo Centurion	1966	21058716- 58818 T2100001- 0197	Maximum weight increased to 3300lbs. One-piece front windscreen, optional three blade propeller available.
C210G T210G	Centurion/ Turbo Centurion	1967	21058819- 58936 T2100198- 0307	Flap reduced to 30 Degrees, full cantilever wing introduced. Fuel capacity increased from 65USG to 90USG integral tank. Maximum weight increased to 3400lbs.
C210H T210H	Centurion/ Turbo Centurion	1968	21058937- 59061 T2100308 on	Improved gear saddle to address cracking problems.
C210J T210J	Centurion/ Turbo Centurion	1969	21059062- 59199	Modification to nose wheel cowling, and increase in engine TBO.
C210K T210K	Centurion II/ Turbo Centurion II	1970- 71	21059200- 59502	Larger cabin, rear child seat now a full seat. Nose gear doors modified. MAUW increased to 3800lbs, and takeoff power increased to 300bhp (5 minutes only).
C210L T210L	Centurion II/ Turbo Centurion II	1972 1971 1972 1973 1976	21059503- 59351 21059352- 59502 21059503- 59719 21059720- 60089 21060090- 61573	A 24 Volt electrical system introduced (1972), electric pump replaces engine driven pump for hydraulics, 3 bladed propeller now standard (1975), aerodynamic improvements increase cruise speed by approx 8kts (1976).

TYPE	NAME	YEAR	MODEL	DIFFERENCES
C210M T210M	Centurion II/ Turbo Centurion II	1977 1978	21061574- 62273 21062274- 62954	Engine increased to 310hp in turbo model, maximum weight increased to 4000lbs on turbo model. Voltage warning light changed from high voltage to low voltage (1979).
C210M /C210N*	Centurion II/ Turbo Centurion II	1979 1980	21062955- 63640 21063641- 64135	Beginning 1979 gear doors removed, resulting in higher gear extension speed (165kts), the main gear cavity no longer closes, nose gear doors do not close on ground.
**Cessna specifies these models as C210M, however the FAA type certification lists them as a C210N. Note, also, many earlier models have had modifications completed to remove the gear doors because they are prone failure and easily damaged.*				
C210N T210N	Centurion II/ Turbo Centurion II	1981 1982 1983 1984	21064136- 64535 21064536- 64772 21064773- 64822 21064823- 64897	Flap limit for 20 degrees increased to 130kts. From 1982 (21064536), fuel selector has BOTH position, a fuel shut off valve, and a manual primer (close to fuel selector on centre console), the fuel reservoir tank changed from one per tank to one central tank and fuel return to main tanks to correct vaporisation problems.
P210N	Pressurized Centurion/II	1978 1979 1980 1981 1982 1983	P21000001 -0150 P21000151 -0385 P21000386 -0590 P21000591 -0760 P21000761 -0811 P21000812 -0834	First pressurised model.

TYPE	*NAME*	*YEAR*	*MODEL*	*DIFFERENCES*
C210R T210R	Centurion II/ Turbo Centurion II	1985- 1986	21064898- 64949 21064950- 65009	Optional 115USG fuel tanks, maximum weight also increased to 4100lbs on turbo model only.
P210R	Pressurized Centurion/ with Value Groups A & B	1985-1986	P21000835-0866 P21000867-0874	Improvements in engine and instrument systems, maximum weight increased to 4100lbs (pressurised model only).

Post Manufacture Modifications Table

Note: Some modifications may no longer be available to fit, but are still in use.

TYPE	*NAME and MANUFACTURER*	*DIFFERENCES and FEATURES*
P210R	Silver Eagle, O & N Aircraft Modifications	Turbine Engine Installation, 450 HP Allison250-B-17F/2 turbine, includes new Garmin panel.
	Engine Conversion, Bonaire	IO550 engine installation with 300hp maximum continuous, (modification not available any more).
C210 K to N	Engine Conversion, Atlantic Aero	Continental IO-550-P engine installation with 310hp maximum continuous, and 2000hr TBO.
T210	Engine Conversion, Ram Aircraft Corp.	Increases engine to 310 HP, including new 402 Prop
C210	Turbo Conversion, Ram Aircraft Corp.	Replaces standard engine with TSIO-520.
P210	P210 Intercoolers, TurboPlus	Increases power available at altitude.
	Wing Tip Tanks, Flint Aero	Two auxiliary fuel tanks of 16.5USG in each installed in the wing tip, and used with an electrical transfer pump to each main tank. Higher MTOW is permitted if tanks are half full. Wing length is also increased by 26 inches.
	Additional Fuel Tank, O & N Aircraft Modifications	Additional 18, 28 or 29.7 USG fuel tank in baggage area.