SECTION 2 - LIMITATIONS

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LIMITATIONS

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SECTION 2

LIMITATIONS

2.1 GENERAL

This section provides the "FAA Approved" operating limitations, instrument markings, color coding and basic placards necessary for the safe operation of the PA-34-200T Seneca II and its systems.

Limitations associated with those optional systems and equipment which require handbook supplements can be found in Section 9 (Supplements).

2.3 AIRSPEED LIMITATIONS

SPEED	KIAS	KCAS
Never Exceed Speed (V_{NE}) - Do not exceed this speed in any operation.	195	195
Maximum Structural Cruising Speed (V_{NO}) - Do not exceed this speed except in smooth air and then only with caution.	163	165
Design Maneuvering Speed (V_A) - Do not make full or abrupt control movements above this speed.		
At 4560 LBS. G.W.	136	138
At 3068 LBS. G.W.	121	122

CAUTION

Maneuvering speed decreases at lighter weight as the effects of aerodynamic forces become more pronounced. Linear interpolation may be used for intermediate gross weights. Maneuvering speed should not be exceeded while operating in rough air.

Maximum Flaps Extended Speed (V_{FE}) - Do not exceed this speed with flaps extended.	107	109
Maximum Gear Extended Speed (V_{LE}) - Do not exceed this speed with landing gear extended.	129	130
Maximum Landing Gear Extending Speed (V_{LO}) - Do not extend landing gear above this speed.	129	130

	KIAS	KCAS
Maximum Landing Gear Retracting Speed (V_{LO}) - Do not retract landing gear above this speed.	107	109
Air Minimum Control Speed (V_{MC}) - Lowest airspeed at which airplane is controllable with one engine operating and no flaps.	66	69
Best Single Engine Rate of Climb Speed	89	90

2.5 AIRSPEED INDICATOR MARKINGS

MARKING	KIAS
Green Arc (Normal Operating Range)	63 to 163
Yellow Arc (Caution Range - Smooth Air)	163 to 195
White Arc (Flaps Extended Range)	61 to 107
Radial Red Line (Never Exceed - Smooth Air)	195
Radial Red Line (Minimum Control Speed - Single Engine)	66
Radial Blue Line (Best Rate of Climb Speed - Single Engine)	89

2.7 POWER PLANT LIMITATIONS

(a) Number of Engines	2
(b) Engine Manufacturer	Continental
(c) Engine Model Number	
(1) Left	TSIO-360E or TSIO-360EB
(2) Right	LTSO-360E or LTSIO-360EB
(d) Engine Operating Limits	
(1) Rated Horsepower	
Sea level	200
12,000 ft.	215
(2) Maximum Rotational Speed (RPM)	2575
(3) Maximum Manifold Pressure (Inches of Mercury)	40
(4) Maximum Cylinder Head Temperature	460°F
(5) Maximum Oil Temperature	240°F
(e) Oil Pressure	
Minimum (red line)	10 PSI
Maximum (red line)	100 PSI
(f) Fuel Flow	
Normal Operating Range (green arc)	3.5 PSI to 20 PSI
Maximum at Sea Level (red line)	25 GPH (20 PSI)
(g) Fuel (minimum grade)	100 or 100LL Aviation Grade
(h) Number of Propellers	2

(i) Propeller Manufacturer:

Hartzell

Propeller Hub and Blade Models

a.	Left	BHC-C2YF-2CKF/FC8459-8R
	Right	BHC-C2YF-2CLKF/FJC8459-8R
b.	Left	BHC-C2YF-2CKUF/FC8459-8R
	Right	BHC-C2YF-2CLKUF/FJC8459-8R

When propeller deicing boots are installed:

c.	Left	BHC-C2YF-2CKF/FC8459B-8R
	Right	BHC-C2YF-2CLKF/FJC8459B-8R
d.	Left	BHC-C2YF-2CKUF/FC8459B-8R
	Right	BHC-C2YF-2CLKUF/FJC8459B-8R

NOTES

Avoid continuous operation between 2000 and 2200 RPM above 32 IN. HG. manifold pressure.

Avoid continuous ground operation between 1700 and 2100 RPM in cross and tail winds over 10 knots.

McCauley

Propeller Hub and Blade Models

a.	Left	3AF34C502/80HA-4
b.	Right	3AF34C503/L80HA-4

When propeller deicing boots are installed: Same as above.

(j) Propeller Diameter (inches)

Maximum	76
Minimum	75

2.9 POWER PLANT INSTRUMENT MARKINGS

(a) Tachometer

Green Arc (Normal Operating Range)	500 RPM to 2575 RPM
Red Line (Maximum)	2575 RPM

(b) Fuel Flow and Pressure	
Green Arc (Normal Operating Range)	3.5 PSI to 20 PSI
Red Line (Maximum at Sea Level)	25 GPH (20 PSI)
Red Line (Minimum)	3.5 PSI
(c) Cylinder Head Temperature	
Green Arc (Normal Range)	either 360°F to 460°F or 240°F to 440°F
Red Line (Maximum)	460°F
(d) Oil Temperature	
Green Arc (Normal Operating Range)	either 75°F to 240°F or 100°F to 240°F
Red Line (Maximum)	240°F
(e) Oil Pressure	
Green Arc (Normal Operating Range)	either 30 PSI to 80 PSI or 30 PSI to 60 PSI
Yellow Arc (Caution)	10 PSI to 30 PSI and, either 80 PSI to 100 PSI or 60 PSI to 100 PSI
Red Line (Minimum)	10 PSI
Red Line (Maximum)	100 PSI
(f) Manifold Pressure	
Green Arc (Normal Operating Range)	10 IN. to 40 IN. HG.
Red Line (Maximum)	40 IN. HG.
(g) Exhaust Gas Temperature	
Red Line	1650°F

2.11 WEIGHT LIMITS

(a) Maximum Takeoff Weight	4570 LBS
(b) Maximum Landing Weight	4342 LBS
(c) Maximum Weights in Baggage Compartments	
Forward	100 LBS
Aft	100 LBS
(d) Maximum Zero Fuel Weight - Standard (See page 6.61 and 6-62.)	4000 LBS

2.13 CENTER OF GRAVITY LIMITS

Weight Pounds	Forward Limit Inches Aft of Datum	Aft Limit Inches Aft of Datum
3400	82.0	94.6
4570	90.6	94.6

NOTES

Straight line variation between the points given.

Datum is 78.4 inches forward of wing leading edge from the inboard edge of the inboard fuel tank.

It is the responsibility of the airplane owner and the pilot to assure that the airplane is properly loaded. Maximum allowable gross weight is 4570 pounds. See "Weight and Balance Section" for proper loading instructions.

2.15 MANEUVER LIMITS

All intentional acrobatic maneuvers (including spins) are prohibited. Avoid abrupt maneuvers.

2.17 FLIGHT LOAD FACTOR LIMITS (Flaps Up)

(a)	Positive Load Factor (Maximum)	3.8 G
(b)	Negative Load Factor (Maximum)	No inverted maneuvers approved

2.19 TYPES OF OPERATIONS

The airplane is approved for the following operations when equipped in accordance with FAR 91 or FAR 135.

(a) Day V.F.R.
(b) Night V.F.R.
(c) Day I.F.R.
(d) Night I.F.R.
(e) Icing conditions when equipped per Section 2.25.

2.21 FUEL LIMITATIONS

(a) Unusable Fuel
The unusable fuel in this aircraft has been determined as 2.5 gallons in each wing in critical flight attitudes (2.5 gallons is the total per side, each side having interconnected tanks).

(b) Usable Fuel
The usable fuel in this aircraft has been determined as 46.5 gallons in each wing or a total of 93 gallons with standard fuel tanks and 61.5 gallons in each wing or a total of 123 gallons with optional fuel tanks installed.

2.23 GYRO PRESSURE LIMITS

The operating limits for the pressure system are 4.5 to 5.2 inches of mercury for all operations as indicated by the gyro pressure gauge.

2.25 FLIGHT INTO KNOWN ICING CONDITIONS

For flight in icing conditions the following equipment must be installed in accordance with Piper drawings or in an FAA approved manner:

(a) Pneumatic wing and empennage boots
(b) Electrothermal propeller boots
(c) Electric windshield panel
(d) Heated pitot head
(e) Wing ice light
(f) Heated lift detectors
(g) Propeller spinners must be installed.

2.27 HEATER LIMITATIONS

Operation of the combustion heater above 25,000 feet is not approved.

2.29 OPERATING ALTITUDE LIMITATIONS

Flight above 25,000 feet is not approved. Flight up to and including 25,000 feet is approved if equipped with oxygen in accordance with FAR 23.1441 and avionics in accordance with FAR 91 or FAR 135.

2.31 NOISE LEVEL

The noise level of this aircraft is 73.1 dB(A) when equipped with two bladed propellers and 76.4 dB(A) when equipped with three bladed propellers.

No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

The above statement notwithstanding, the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flights conducted in accordance with FAR 36, Noise Standards - Aircraft Type and Airworthiness Certificaton. This aircraft model is in compliance with all FAR 36 noise standards applicable to this type.

2.33 PLACARDS

In full view of the pilot:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS, AND MANUALS. NO ACROBATIC MANEUVERS (INCLUDING SPINS) APPROVED.

THIS AIRCRAFT APPROVED FOR V.F.R., I.F.R., DAY, NIGHT AND ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91 OR FAR 135.

In full view of the pilot:

MAXIMUM TAKEOFF WEIGHT 4570 POUNDS
MAXIMUM LANDING WEIGHT 4342 POUNDS
ALL WEIGHT IN EXCESS OF 4000 POUNDS MUST CONSIST OF FUEL.

OR

MAXIMUM TAKEOFF WEIGHT 4570 POUNDS
MAXIMUM LANDING WEIGHT 4342 POUNDS
ALL WEIGHT IN EXCESS OF 4000 POUNDS MUST CONSIST OF FUEL, (EXCEPT IN CASES SPECIFIED BY SECTION 6 OF P.O.H.).

MINIMUM SINGLE ENGINE CONTROL SPEED 66 KIAS

On instrument panel in full view of the pilot:

MANEUVERING SPEED 136 KIAS AT 4570 LBS. (SEE P.O.H.)		OR	V_A 136 AT 4570 LBS. (See P.O.H.)	
GEAR DOWN	129 KIAS (MAX.)	OR	V_{LO}	129 DN, 107 UP
GEAR UP	107 KIAS (MAX.)		V_{LE}	129 MAX.
EXTENDED	129 KIAS (MAX.)			

DEMONSTRATED CROSSWIND COMPONENT 17 KTS
OR
DEMO X-WIND 17 KTS

Near emergency gear release:

EMERGENCY GEAR EXTENSION
PULL TO RELEASE. SEE P.O.H.
BEFORE RE-ENGAGEMENT

Near gear selector switch:

GEAR UP	107 KIAS MAX.
DOWN	129 KIAS MAX.

Adjacent to upper door latch (Front and rear doors):

ENGAGE LATCH BEFORE FLIGHT

In full view of pilot:

WARNING - TURN OFF STROBE LIGHTS WHEN TAXIING IN VICINITY OF OTHER AIRCRAFT, OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE.

On the inside of forward baggage compartment door:

MAXIMUM BAGGAGE THIS COMPARTMENT 100 LBS. SEE THE LIMITATIONS SECTION OF THE PILOT'S OPERATING HANDBOOK.

On aft baggage closeout:

MAXIMUM BAGGAGE THIS COMPARTMENT 100 LBS. NO HEAVY OBJECTS ON HAT SHELF.

On instrument panel:

SINGLE ENGINE STALLS NOT RECOMMENDED. CAN CAUSE 500 FT. LOSS OF ALTITUDE AND 15° PITCH ANGLE.

On instrument panel or sun visor:

TAKEOFF CHECK LIST	LANDING CHECK LIST	"LANDING CHECK LIST
Fuel Selectors On	Seat Backs Erect	Seat Backs Erect
Aux. Fuel Pump Off	Fasten Belts/Harness	Fasten Belts/Harness
Alternators On	Fuel Selectors On	Fuel Selectors On
Engine Gages Checked	Cowl Flaps Set	Cowl Flaps Set
Mixtures Set	Mixtures Rich	Mixtures Rich
Propellers Set	Aux. Fuel Pump Off	Aux. Fuel Pump Off
Alt. Air Off	Propellers Set	Propellers Set
Cowl Flaps Open	Gear Down	Gear Down
Seat Backs Erect	Flap Set - 107 KIAS Max.	Flap Set - (White Arc)
Flaps Set	Air Conditioner Off	Air Conditioner Off"
Trim Set (Stab. & Rudder)	OR	
Fasten Belts/Harness		
Controls Free - Full Travel		
Doors Latched/Air Cond. Off		

The "Air Conditioner Off" item in the above takeoff and landing check lists is mandatory for air conditioned aircraft only.

On storm window:

DO NOT OPEN ABOVE 129 KIAS

Near windshield panel heat switch with windshield heating installation:

WINDSHIELD PANEL HEAT - SEE PILOT'S OPERATING HANDBOOK.

On engine instrument panel cover to left of engine controls with windshield heating installation without the entire Ice Protection System installed:

WARNING - THIS AIRCRAFT IS NOT APPROVED FOR FLIGHT IN ICING CONDITIONS.

In full view of the pilot for flight with the aft fuselage doors removed:

FOR FLIGHT WITH AFT DOORS REMOVED, CONSULT THE LIMITATIONS AND PROCEDURES SECTIONS OF THE PILOT'S OPERATING HANDBOOK.

Beneath the pitot heat switch:

GND. OPP.
3 MIN. MAX.

On the inside of both oil filler access doors:

OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50°F.

On the throttle quadrant below engine and propeller controls:

USE PROP SYNC MANUAL FOR TAKE-OFF LANDING AND SINGLE ENGINE OPERATIONS.

On the executive writing table:

CAUTION - THIS TABLE MUST BE STOWED DURING TAKEOFF AND LANDING.

On the instrument panel in full view of the pilot:

AVOID CONTINUOUS GROUND OPERATION 1700- 2100 RPM IN CROSS/TAIL WIND OVER 10 KT

AVOID CONTINUOUS OPERATIONS 2000- 2200 RPM ABOVE 32" MANIFOLD PRESSURE

Adjacent to fuel tank fill caps with standard fuel tanks installed:

FUEL - 100/130 AVIATION GRADE - USABLE CAPACITY 46.5 GAL.
OR
FUEL - 100 OR 100LL AVIATION GRADE

Adjacent to fuel tank filler caps with optional fuel tank installed:

FUEL - 100/130 AVIATION GRADE - USABLE CAPACITY 61.5 GAL.
OR
FUEL - 100 OR 100LL AVIATION GRADE