



Our Wings Carry Your Dreams

Pilot Operating Handbook (POH)

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Introduction

Every aircraft has a Pilot Operating Handbook (POH). It is a guide for pilots about the aircraft that they are flying. Inside it includes all the information that you need for the aircraft type, how to handle the aircraft, what systems does it have and also include how to calculate the performance, weight and balance and how to conduct maintenance and servicing. In order to use this handbook a pilot needs to keep it current and update it if anything changes.

In this Mini Brief we will use a Warrior III PA28-161 POH as an example.

What is in a POH?

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SECTION 9	SUPPLEMENTS
SECTION 10	OPERATING TIPS

Using the table of contents we can see there are different sections and depending on what information you want, you can look up different sections.

Section 1 - General

In section 1 there is general information about the aircraft such as the dimensions of the aircraft, what engine does it use, engine figures such as horsepower, the correct fuel that is to be used and fuel capacity etc. There are also a definition and terminology area that a pilot will be using during operations.

PIPER AIRCRAFT CORPORATION PA-28-161, WARRIOR III

SECTION 1 GENERAL

1.3 ENGINES

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model Number	O-320-D3G
(d) Rated Horsepower	160
(e) Rated Speed (rpm)	2700
(f) Bore (inches)	5.125
(g) Stroke (inches)	3.875
(h) Displacement (cubic inches)	319.8
(i) Compression Ratio	8.5:1
(j) Engine Type	Four Cylinder, Direct Drive, Horizontally Opposed, Air Cooled

IAS	Indicated Airspeed is the speed of an aircraft as shown on the airspeed indicator when corrected for instrument error. IAS values published in this handbook assume zero instrument error.
KIAS	Indicated Airspeed expressed in Knots.
M	Mach Number is the ratio of true airspeed to the speed of sound.
TAS	True Airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature and compressibility.
V _A	Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V _{FE}	Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.

Section 2 - Limitations

In section 2 there are the Limitations of the aircraft. An aircraft must operate in a category and only operate within the limits that are stated in this section. Limitations such as airspeed, weight, centre of gravity, flight load, and manoeuvre limits etc. Also, there is operation equipment list for the aircraft.

2.11 WEIGHT LIMITS

	Normal	Utility
(a) Maximum Weight	2440 LBS	2020 LBS
(b) Maximum Ramp Weight	2447 LBS	2027 LBS
(c) Maximum Baggage	200 LBS	0 LBS

NOTE

Refer to Section 5 (Performance) for maximum weight as limited by performance.

2.21 FUEL LIMITATIONS

(a) Total Capacity	50 U.S. GAL
(b) Unusable Fuel	2 U.S. GAL
The unusable fuel for this airplane has been determined as 1.0 gallon in each wing in critical flight attitudes.	
(c) Usable Fuel	48 U.S. GAL
The usable fuel in this airplane has been determined as 24.0 gallons in each wing.	

Section 3 - Emergency Procedures

In section 3 are the recommended procedures for various types of emergencies and critical situations.

Where the emergency is not immediately life threatening pilots are to refer to the POH after conducting initial checks from memory to determine how to proceed.

In saying that, it is best to know the critical emergency procedures off by heart so that in a real emergency you can react as quick as possible to prevent valuable time lost.

You will find that in the engineering questionnaire you will be required to write down a lot of these procedures as an answer.

This is an example of an emergency check list that must be memorised.

POWER OFF LANDING

Locate suitable field.

Establish spiral pattern.

1000 ft. above field at downwind position for normal landing approach.

When field can easily be reached slow to 63 KIAS for shortest landing.

Touchdowns should normally be made at lowest possible airspeed with full flaps.

When committed to landing:

IgnitionOFF

Battery Master switchOFF

ALTR SwitchOFF

Fuel selectorOFF

Mixtureidle cut-off

Seat belts and harnessestight

Section 4 - Normal Procedures

Section 4 is basically all the normal procedures that you will conduct in flight and the checklist that goes with the procedure. Our quick reference handbook is based on this section and complies with our flight school operations manual.

If there is new equipment fitted into the aircraft which will change the checklist, they will be attached in section 9.

Normal operation such as aircraft start up, daily inspection to approach and landing to stopping engine are all included in this section. They are in the form of a checklist, so it is to be done off memory and then check it has been done afterwards not the other way around.

NORMAL

Flaps.....	set
Trim	set
Accelerate to 45 to 55 KIAS	
Control wheel.....	back pressure to rotate to climb attitude

0° FLAPS TAKEOFF PERFORMANCE

Flaps.....UP
Accelerate to 40-52 KIAS (depending on weight)
Control Wheel.....back pressure to
rotate to climb attitude
Accelerate to and maintain 44 to 57 KIAS (depending on weight) until
obstacle clearance is achieved and climb out at 79 KIAS.

PARKING

Parking brake	set
Control wheel	secure with belts
Flaps	full up
Wheel chocks.....	in place
Tie downs	secure

Section 5 - Performance

It is this section which contains information on how the aircraft will perform and all the charts that allow the pilot to calculate performance in different aircraft configuration, weather conditions and aerodrome conditions.

Your instructor will teach you how to use them. Remember they are not factored, and your instructor will brief you on how to apply a factoring amount to the performance charts.

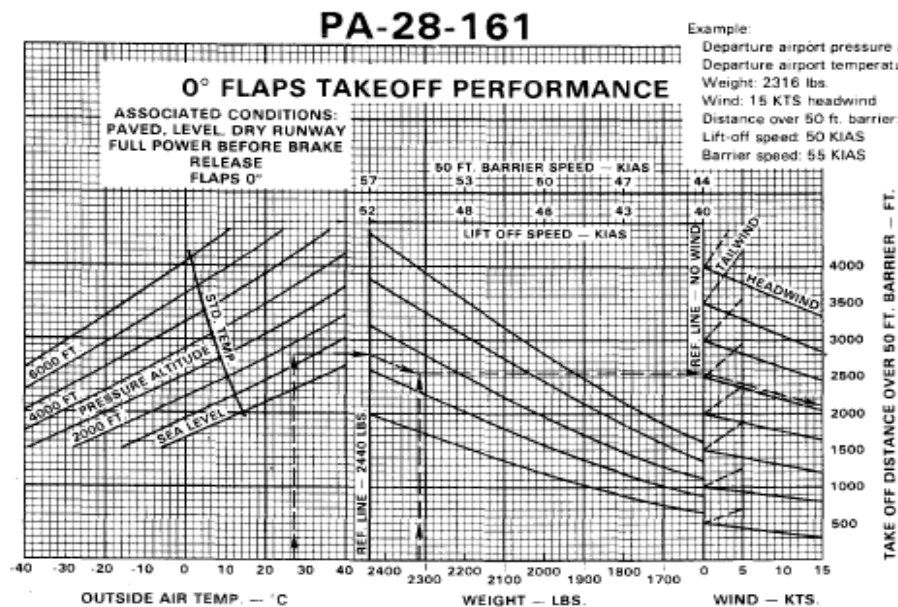
Performance charts are included for take-off performance, climbing performance, and cruise performance with different power settings, endurance of aircraft etc.

Every take-off and landing that you conduct at an airport will require consideration of the aircraft performance on the day.

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0° FLAPS TAKEOFF PERFORMANCE
Figure 5-9



PIPER AIRCRAFT CORPORATION
PA-28-161, WARRIOR III
SECTION 5
PERFORMANCE

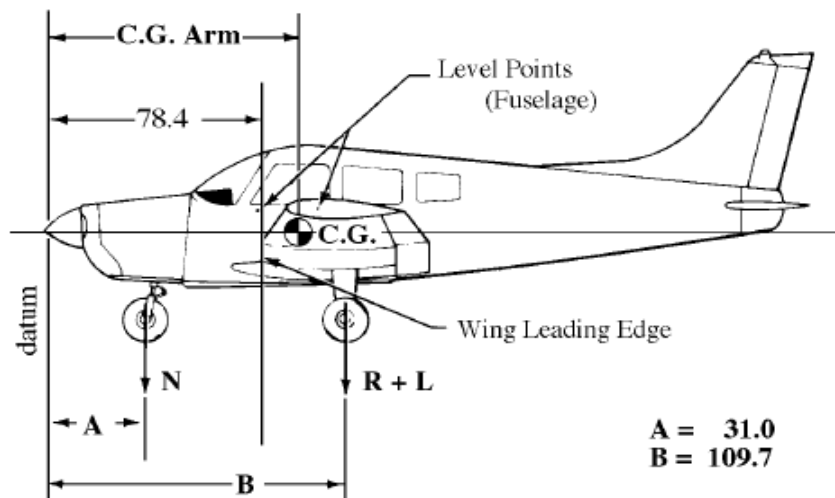
Engine & Cruise Performance for Non-ISA OAT
RPM for Constant 55% Power
Fuel Flow: Best Economy Mixture 7.9 GPH

Pressure Altitude Feet	Indicated Outside Air Temperature			Engine Speed RPM	True Air Speed Knots
	°C	°C	°F		
Sea Level	ISA-15	0	32	2210	92
	ISA	15	59	2250	
	ISA +10	25	77	2280	
	ISA +20	35	95	2300	
	ISA +30	45	113	2330	
2000	ISA-15	-4	25	2260	94
	ISA	11	52	2300	
	ISA +10	21	70	2320	
	ISA +20	31	88	2350	
	ISA +30	41	106	2370	

Section 6 - Weight and Balance

In order to calculate aircraft performance, we will need to have basic information about the aircraft weight and balance and centre of gravity (CG). In section 6, there is all the information about the aircraft's weight and balance, loading limitation and charts so that you can calculate the CG position for the aircraft.

This section needs to be done before every flight to prove that the aircraft that you are flying with you and your passenger on board are within the limits of the aircraft for the conditions that you have that day. They are one of the first few items we need to check before we go flying.



LEVELING DIAGRAM

Figure 6-3

	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger		80.5	
Passengers (Rear Seats)*		118.1	
Fuel (48 Gallon Maximum)		95.0	
Baggage* (200 Lbs. Maximum)		142.8	
Ramp Weight (2447 Lbs. Normal, 2027 Lbs. Utility Maximum)			
Fuel Allowance For Engine Start, Taxi and Run Up	-7	95.0	-665
Takeoff Weight (2440 Lbs. Normal, 2020 Lbs. Utility Maximum)			

Section 7 - Systems

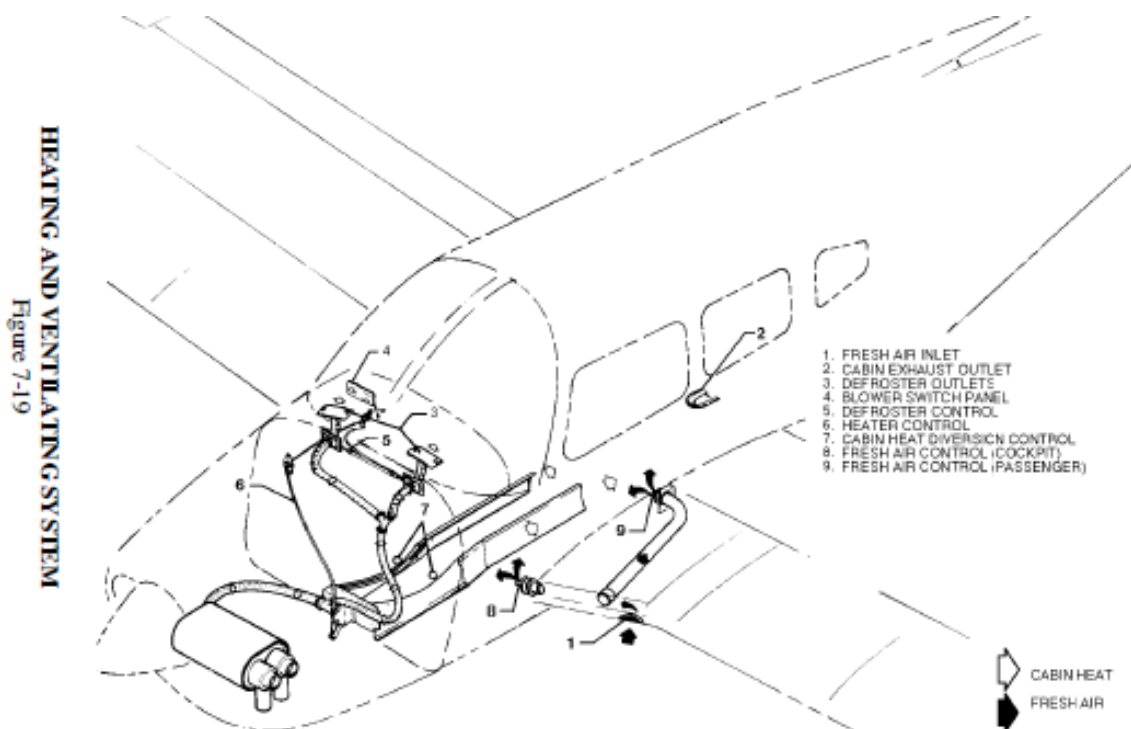
This section contains the description and operation of the aircraft and its systems. It will talk about what type of airframe is it, what type of aircraft is it. For example, the PA28 is a Warrior III with single engine fixed gear monoplane with all metal construction with low semi-tapered wings. If want to know what types of flap it has installed, what type of brakes it has, details of the electrical system, how does the fuel system works and what is a Pitot-Static system, it will be in this section.

IF there are new systems added to the aircraft such as a new GPS, this information can be found in section 9 - supplements.

7.13 FUEL SYSTEM

Fuel is stored in two twenty-five gallon (24 gallons usable) fuel tanks, giving the airplane a total capacity of fifty U.S. gallons (48 gallons usable). Each tank is equipped with a filler neck indicator tab to aid in determining fuel remaining when the tanks are not full. Usable capacity to the bottom of the indicator tab is 17 gallons. The tanks are secured to the leading edge of each wing with screws and nut plates. This allows removal for service or inspection.

The fuel tank selector control (Figure 7-7) is located on the left side panel forward of the pilot's seat. The button on the selector cover must be depressed and held while the handle is moved to the OFF position. The button releases automatically when the handle is moved back to the ON position.



Section 8 - Aircraft Handling Servicing and Maintenance

In this section there are general guidelines as to how to handle service and maintenance on the type of aircraft. For complete maintenance instructions refer to the Maintenance Manual. As for which items pilot can conduct maintenance on, please refer to schedule 8.

(b) Taxiing

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Engine starting and shut-down procedures as well as taxi techniques should be covered. When it is ascertained that the propeller back blast and taxi areas are clear, power should be applied to start the taxi roll, and the following checks should be performed:

- (1) Taxi a few feet forward and apply the brakes to determine their effectiveness.
- (2) While taxiing, make slight turns to ascertain the effectiveness of the steering.
- (3) Observe wing clearance when taxiing near buildings or other stationary objects. If possible, station an observer outside the airplane.

8.21 FUEL SYSTEM

(a) Servicing Fuel System

At every 50-hour inspection, the fuel screens in the strainer, in the electric fuel pump, and at the carburetor inlet must be cleaned.

(b) Fuel Requirements (AVGAS ONLY)

The minimum aviation grade fuel for the PA-28-161 is 100. Since the use of lower grades can cause serious engine damage in a short period of time, the engine warranty is invalidated by the use of lower octanes.

Whenever 100 or 100LL grade fuel is not available, commercial grade 100/130 should be used. (See Fuel Grade Comparison Chart). Refer to the latest issue of Lycoming Service Instruction No. 1070 for additional information.

CAR 1988 Schedule 8

3.1 Schedule 8—Maintenance that may be carried out on a Class B aircraft by a person entitled to do so under subregulation 42ZC(4)

Part 1—Maintenance on Class B aircraft other than balloons

1. Removal or installation of landing gear tyres, but only if the removal or installation does not involve the complete jacking of the aircraft.
2. Repair of pneumatic tubes of landing gear tyres.
3. Servicing of landing gear wheel bearings.
4. Replacement of defective safety wiring or split pins, but not including wiring or pins in control systems.
5. Removal or refitting of a door, but only if:
 - (a) no disassembly of the primary structure or operating system of the aircraft is involved; and
 - (b) if the aircraft is to be operated with the door removed — the aircraft has a flight manual and the manual indicates that the aircraft may be operated with the door removed.
6. Replacement of side windows in an unpressurised aircraft.

Section 9 - Supplement

This section provides information in the form of supplements which are necessary for efficient operation of the airplane when equipped with one or more of the various optional systems and equipment not provided with the standard aeroplane. For example, see below where there are updates on the emergency procedures, use it if applicable.

SECTION 3 - EMERGENCY PROCEDURES

LOSS OF VACUUM SUCTION - Vacuum inop (VAC) annunciator and VAC OFF warning lamp lit

1. Vacuum gaugeCheck to verify inoperative pump.
If vacuum gauge reads below 4.5 inches of mercury:
2. Auxiliary vacuum switchPress AUX ON.
3. Verify vacuum pressure of 4.8 to 5.2 inches of mercury.
4. Verify VAC inop annunciator and VAC OFF lights go out.

CAUTION

Compass error may exceed 10 when auxiliary vacuum system is in operation.

5. Electrical loadMonitor
 - a. Verify alternator capacity is not being exceeded.
 - b. If required, turn off nonessential electrical equipment.

Section 10 - Operating Tips

This section provides operating tips of particular value in the operation of the aircraft to assist pilots to conduct their flight.

10.3 OPERATING TIPS

- (a) Learn to trim for takeoff so that only a very light back pressure on the control wheel is required to lift the airplane off the ground.
- (b) The best speed for takeoff is about 55 KIAS under normal conditions. Trying to pull the airplane off the ground at too low an airspeed decreases the controllability of the airplane in the event of engine failure.
- (c) Flaps may be lowered at airspeeds up to 103 KIAS. To reduce flap operating loads, it is desirable to have the airplane at a slower speed before extending the flaps. The flap step will not support weight if the flaps are in any extended position. The flaps must be placed in the "UP" position before they will lock and support weight on the step.

Reference Material

Warrior PA28-161 POH

CAR 1988 Schedule 8

