

Hamilton Pilot Training Systems (HPTS) FAA “Pilot’s Handbook of Aeronautical Knowledge” study guide for sport pilots

What Sport Pilots should study in the FAA “Pilot’s Handbook of Aeronautical Knowledge” 8083-25 book for Sport pilots training, background for the Sport Pilot Knowledge exam, and background for the Sport Pilot Practical Test.

There are additional study guides similar to this also for the ASA “FAR/AIM” book and the “Visualized Flight Maneuvers” book. Updates for the Sport Pilot Knowledge (written/computerized) are also available as the FAA changes and adds questions.

Follow this guide on what to study and what not to study.

Study all material in the book unless noted not to, or study modifications as outlined in this guide.

Weight-shift Control and Powered Parachutes will have to modify all sections for the specific category of aircraft. This document provides what to study in this existing reference, but does not cover the additional information needed for WSC, PPC or modern LSA airplanes.

Study Tips:

1. In “Pilot’s Handbook of Aeronautical Knowledge” book itself, in pencil, cross off and modify items listed in this document to help you study as you go and provide a working document for future use.
2. Go over this with your instructor to make notes and prepare for your practical test (Checkride).

Abbreviations for Weight-Shift Control (WSC) and Powered Parachute (PPC) are used in this document. Vintage or older Light-Sport airplanes (LSA) meeting the Light Sport criteria such as Piper J-3 Cubs, etc. are called Standard category airplanes.

Chapter 1 Aircraft Structure

This is a short chapter that deals specifically with the airplane category. WSC and PPC pilots can look at the “WINGS” section, and review the “LANDING GEAR” and “POWER PLANT”. Specifics on the WSC/PPC wings and fuselage should be covered with your instructor, and through the Learn to Fly and Preflight DVD’s.

Chapter 3 Aerodynamics of Flight

PPC Overview - For this section, the increased speeds, stalls, and spins are not applicable to PPC and can be ignored.

WSC Overview - For this section the spins are not applicable to WSC and can be ignored.

Page 3-7 PPC can ignore “GROUND EFFECT” because the wing is so high above the ground, to be affected by ground effect.

Page 3-10 PPC are statically and dynamically stable. You may ignore the pages 3-11 starting with “LONGITUDINAL STABILITY” through page 3-17 column 1, and pick it back up on Page 3-17 “AERODYNAMIC FORCES IN FLIGHT MANEUVERS”.

Pages 3-18 and 3-19 PPC and WSC can ignore “SLIPPING TURNS” and “SKIDDING TURNS”.

Page 3-24 PPC and WSC can ignore the “CORKSCREW EFFECT”.

Page 3-26 “LOAD FACTORS IN AIRPLANE DESIGN” is for standard category aircraft. S-LSA and E-LSA will have similar load limits but are specified in the Pilot Operating Handbook (POH).

Page 3-28 PPC can ignore “LOAD FACTORS AND STALLING SPEEDS”

Page 3-29 PPC all "STALLS" and "SPINS" can be ignored

Page 3-29 WSC all "SPINS" can be ignored

Page 3-30 "CHANDELLS AND LAZY EIGHTS" can be ignored for all sport pilots,

Page 3-30 PPC ignore "VG DIAGRAM"

Page 3-33 WSC and PPC ignore "EFFECT OF LOAD DISTRIBUTION"

Page 3-35 HIGH SPEED FLIGHT can be ignored by all through end of Chapter 3

Chapter 4 Flight Controls

PPC and WSC ignore this complete chapter.

Chapter 5 Aircraft Systems

Page 5-1 and 5-2 applies to four stroke engines. Two strokes combine the intake/compression stroke and the power/exhaust strokes without valves to accomplish the same objective.

Page 5-4 ignore "ADJUSTABLE PITCH PROPELLER"

Page 5-5 "MIXTURE CONTROL" (most light sport aircraft have ground adjustable jets, where Standard category (vintage LSA) do use mixture controls.

Page 5-9 through 5-11 ignore "SUPERCHARGERS and TURBOSUPERCHARGERS" Only a few 4 stroke LSA engines have turbo or super chargers. Only study if your aircraft has this system.

Page 5-15 "FUEL GRADES" most LSA use auto gas except Standard category. Most modern LSA use auto gas.

Page 5-16 "OIL SYSTEMS" is for 4 stroke only where 2 stroke is different.

Page 5-19 through 5-22 "ELECTRICAL SYSTEMS" is generally more complicated with more accessories but basically the same general systems for LSA. Only study if your aircraft has an electric system (battery, main switch/key/ electric starter).

Page 5-22 "HYDRAULIC SYSTEM" is only for aircraft with these type of systems

Page 5-22 and 5-23 WSC and PPC ignore "NOSE & TAIL WHEEL".

Page 5-23 ignore "AUTOPILOT" through the end of Chapter 5.

Chapter 6 Flight Instruments

This section is more detailed than the typical Light-Sport Aircraft systems. Some Powered Parachutes have no flight instruments and can ignore this section completely. Only study the instruments you have.

Page 6-1 "PITOT STATIC FLIGHT INSTRUMENTS", lower speed aircraft may not have a separate static line and port, they just read the ambient static pressure.

Page 6-9 ignore "GYROSCOPIC FLIGHT INSTRUMENTS" section through page 6-14 unless your aircraft has these instruments (not typical on LSA).

Chapter 8 Weight and Balance

Page 8-2 ignore "BALANCE, STABILITY, AND CENTER OF GRAVITY" through end of chapter.

Chapter 9 Aircraft Performance

Page 9-5 for PPC "STRAIGHT AND LEVEL FLIGHT" - the PPC is trimmed at the minimum total drag or slightly faster to relate the THIS explanation for the single speed PPC. PPC ignore the slower and faster speeds explanations.

Page 9-10 PPC ignore "GROUND EFFECT".

Page 9-12 PPC ignore "REGION OF REVERSED COMMAND" .

Page 9-18 PPC ignore "PERFORMANCE SPEEDS".
WSC and Airplane ignore the speeds not applicable to you.

Page 9-19 "PERFORMANCE CHARTS" section through Page 9-13.
Light Sport Aircraft will not have as detailed performance data or details as presented here. It is most likely there will be one situation at Sea level Standard conditions and maximum gross weight where the takeoff distance and/or distance over a 50 foot obstacle is included. Reviewing these charts reveals that there are great differences in takeoff distances, distance over a 50 foot obstacle with down wind takeoffs, high density altitude, uphill/rough field, etc.

Page 9-20 "DENSITY ALTITUDE" and Page 9-28 "CROSSWIND COMPONENT CHARTS" are both important for Sport Pilots to study, understand and use.

Page 9-31 ignore "TRANSPORT CATEGORY AIRPLANE PERFORMANCE" through the end of Chapter 9.

Chapter 11 Weather Reports, Forecasts, and Charts

The FAA covers significantly more weather Reports, Forecasts, and Charts than needed for the Sport Pilot, however, the more weather information you gather, the better an evaluation you can do.

There is a great difference in a Sport Pilot flying a Powered Parachutes around the pattern, to Light Sport airplanes cruising at 120 knots and going on long cross country trips.

Many pilots flying around in the pattern observe the weather only and feel this is an acceptable weather analysis. This is done by experienced pilots and works most of the time. However, knowing how hard the wind is blowing 3000 feet above you, plus what the wind is predicted to do during the time of your flight, should be the minimum preflight weather analysis in addition to observation the sky for these local flights.

The high performance cross country pilot does need more analysis and should study most areas in this section.

The "Weather to Fly for Sport Pilots" is the time proven system for Sport Pilots and should be used by all to evaluate the weather to make the important go/no go decision.

Here are the specific FAA reports I recommend that are particularly useful for all sport pilots.

Page 11-3 "WEATHER BRIEFINGS - STANDARD/ABBREVIATED/OUTLOOK" great to call 1-800-WX-Brief and get the report from an aviation specialist.

Page 11-4 "AVIATION ROUTINE WEATHER REPORT" what the conditions are at specific locations. Great to find out if your airport is fogged in or blown out before you drive there. These are now decoded on the internet so you do not have to memorize the coding as discussed in the book.

Page 11-9 "TERMINAL AERODROME FORCASTS" what are the predicted conditions at specific locations. Great to get predicted conditions to have find out what the predictions are for the airport being fogged in or blown out in the near future. These are now decoded on the internet so you do not have to memorize the coding as discussed in the book.

Page 11-13 "WINDS AND TEMPERATURE ALOFT FORECAST (FD)" a great tool for predicting winds above and in the near future. The best tool for determining wind limitations for Light-Sport Aircraft.

Page 11-18 "SIGNIFICANT WEATHER PROGNOSTIC CHARTS" predict the big picture for fronts approaching and isobars/wind

Chapter 13 Airspace

It is important to note that the minimum visibility for Sport Pilots is 3 statute miles and 10,000 feet MSL maximum altitude in FAR 61.315 which overrides the airspace listed in this chapter.

Chapter 14 Navigation

Page 14-3 to 14-16 "MEASUREMENT OF DIRECTION" section details of a magnetic compass is not needed if there is no magnetic compass in the aircraft. Many LSA use a GPS instead of a magnetic compass for measurement of direction.

Page 14-17 to 14-25 ignore "RADIO NAVIGATION" section unless you have this equipment in your aircraft.

Chapter 15 Aeromedical Factors

Page 15-10 ignore "NIGHT VISION" to end of Chapter 15.