“Pilot’s Handbook of Aeronautical Knowledge” FAA 8083-25A (2008 version)

Note: This FAA publication is used for the Airplane and PPC. The Weight-Shift Control Trike uses a different book "Weight-Shift Control Aircraft Pilot's Handbook of Aeronautical Knowledge" written by Paul Hamilton and published by Adventure Productions which is specifically written for Weight-Shift Control Trikes.

Airplane and PPC study all chapters 2, 3, 5, 8, 9, 11, 13 and 17 **not** listed below unless otherwise specified.

Chapter 1 Introduction to Flying (8083-25A)

This is a good introduction to flying but the specifics for Sport Pilot and Light-Sport Aircraft are better covered in the specific category Flying Handbooks.

Chapter 2 Aircraft Structure (8083-25A)

PPC ignore this chapter

Chapter 4 Aerodynamics of Flight (8083-25A)

Some of the material in this chapter duplicates that in the Category specific Flight Manual but it is provided in a different way and helps to understand the concepts.

- Page 4-9 to 4-10 PPC can ignore Ground effect
- Page 4-14 to 4-18 PPC can ignore and start 4-19 at “Aerodynamic Forces in Flight Maneuvers”
- Page 4-26 PPC ignore “Corkscrew effect” section
- Page 4-28 “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 Aircraft Operating Instructions (AOI).
- Page 4-30 to end of chapter PPC can ignore
- Page 4-39 all ignore “High Speed Flight” to the end of chapter

Chapter 5 Flight Controls (8083-25A)

PPC ignore this chapter

Chapter 6 Aircraft Systems (8083-25A)

- Page 6-6 to 6-7 all ignore “ADJUSTABLE-PITCH PROPELLER” section. Start back with the INDUCTION SYSTEMS section.
- Page 6-8 “MIXTURE CONTROL” Most light sport aircraft two stroke have ground adjustable jets, or automatic mixture control on the four stroke Rotax 912 engines. Some LSA with (Continental engines) especially Standard category (vintage LSA) do use mixture controls.
- Page 6-11 through 6-14 ignore “SUPERCHARGERS and TURBOSUPERCHARGERS” Only a few four stroke LSA Rotax 914 engines have turbo chargers. Only study if your aircraft has this system.
- Page 6-16 “OIL SYSTEMS” is for 4 stroke only where 2 stroke engines are different.
- Page 6-19 ignore (FADEC) since these are not typically used on smaller engines.
- Page 6-20 through 6-24 ignore TURBINE ENGINES section
- Page 6-28 through 6-30 “ELECTRICAL SYSTEMS” is generally more complicated with more accessories, but basically the same general systems are used for LSA.
- Page 6-30 “HYDRAULIC SYSTEM” is only for aircraft with these type of systems. Many LSA use hydraulic brakes.
- Page 6-32 ignore “PRESSURIZED AIRCRAFT” section and everything through the end of this chapter.

Chapter 7 Flight Instruments (8083-25A)

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 7-1 “PITOT STATIC FLIGHT INSTRUMENTS”, lower speed and/or open cockpit aircraft may not have a pilot tube heater or separate static line and port which just reads the ambient static pressure.
- Page 7-9 PPC ignore through page 7-22 and start at Compass Systems.
- Page 7-15 all ignore Gyroscopic instruments through page 7-22 and start at Compass Systems
- Page 7-12 (EFD) section is generally not on LSA but more complex aircraft however more and more LSA airplanes are using them .
- Page 7-14 through 7-15 Ignore ADC section
- Page 7-15 ignore “GYROSCOPIC FLIGHT INSTRUMENTS” section through 7-22 Compass Systems unless your aircraft has these instruments (not typical on LSA which use electric instruments).

Chapter 9 Weight and Balance (8083-25A)

PPC ignore this chapter

Chapter 10 Aircraft Performance (8083-25A)

- Page 10-17 “PERFORMANCE CHARTS” section through Page 10-26. Most 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 plus some increases in altitude and ambient temperature with maximum gross weight where the takeoff distance and/or distance over a 50 foot obstacle is included. Reviewing these charts revels that there are great differences in takeoff distances, distance over a 50 foot obstacle with downwind takeoffs, high density altitude, uphill/rough field, etc.
- Page 10-26 ignore “TRANSPORT CATEGORY AIRPLANE PERFORMANCE” and everything through the end of Chapter 10.

Chapter 12 Weather Reports, Forecasts, and Charts (8083-25A)

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 Parachute 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 at the field/airport 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 winds and 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” DVD 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 12-5 “WEATHER BRIEFINGS - STANDARD/ABBREVIATED/OUTLOOK” great to call 1-800-WX-Brief and get the report from an aviation specialist. However, he/she is looking at the same data as you have available so if you are confident and gain experience you can gather the same data as the 1-800-WX-Brief provides.

Page 12-6 “AVIATION ROUTINE WEATHER REPORT” (METAR) what the conditions are at specific airport 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 12-10 “TERMINAL AERODROME FORCASTS” (TAF) 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 12-14 “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. There is also a graphical version of this which is very helpful in looking at the near and far term winds aloft.

Page 12-18 “SIGNIFICANT WEATHER PROGNOSTIC CHARTS” prediction of flight conditions such as ceilings, freezing levels, turbulence and big picture of pressure systems, fronts and isobars/wind

Page 12-21 ELECTRONIC FLIGHT DISPLAYS(EFD)/MULTI_FUNCTION DISPLAY (MFD) WEATHER Most LSA do not have EFD/MFD so this section can be skipped to the end of the chapter unless you have this sophisticated weather system in your aircraft.

Chapter 14 Airspace (8083-25A)

It is important to note that the minimum visibility for Sport Pilots is 3 statute miles and 10,000 feet MSL or 2000 AGL whichever is higher maximum altitude in FAR 61.315 which overrides the 1 statute mile visibility specified for some airspaces listed in this chapter.

Chapter 15 Navigation (8083-25A)

Page 15-5 to 15-8 “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 15-15 you can use the flight log in the cross country planning Part 2 of this book.

Page 15-21 to 15-32 ignore “RADIO NAVIGATION” section unless you have this equipment in your aircraft and pick it back up at the GLOBAL POSITIONING SYSTEM Page 15-32

Chapter 16 Aeromedical Factors (8083-25A)

Page 16-18 ignore “NIGHT VISION” and everything to the end of Chapter 16.