

1 2 3 4 5 Things You Should **KNOW** About LSA Operating Limitations



How much do you know about your LSA aircraft's operating limitations?

Probably not a lot - if you're like most people, but that could be dangerous. Before you fall prey to a costly mistake, read on.

1 If you have a LSA aircraft, you have operating limitations. “Operating Limitations” that are issued to each and every LSA aircraft per FAR 91.319(e) and further defined by FAA Order 8130.2F. This is the FAA guidance to FAA Airworthiness Inspectors, or FAA authorized Designated Airworthiness Representatives (DAR’s) for issuing aircraft operating limitations to newly certified aircraft. These operating limitations define the exact test flight, normal flight, maintenance procedures, etc. that the owner(s) of an LSA aircraft must follow in order to retain the airworthiness certificate for his/her aircraft.



The aircraft operating limitations must be carried on the aircraft along with the airworthiness certificate, the registration, weight and balance and the pilots operating instructions.


You may be surprised to learn that all operating limitations are written specifically for each LSA aircraft. So it is likely that two identical aircraft will have differences in the operating limitations. There is an FAA order that gives the FAA inspector or DAR guidelines, however there is room for aircraft owners to request certain optional op-

erating limitations, such as aerobatics or night flight, for example, provided that the aircraft is equipped in accordance with 14 CFR 91.205.


Additionally, depending on the local area, pilot experience, aircraft condition, or a host of other reasons the FAA inspector or DAR may issue additional restrictions to the operating limitations in the interest of safety. This may include limitations requiring certain equipment, endorsements, or even limiting passengers. For example, the FAA regulations do not require a person flying solo in an experimental aircraft to hold the specific category/class rating for that aircraft. However, the operating limitations issued to the individual aircraft as a part of its airworthiness certificate may include the requirement for the pilot to hold the appropriate category/class rating even when flying solo.

Therefore- you should read your aircraft operating limitations carefully to understand what is required and prohibited when operating the aircraft.

2 Experimental light sport aircraft operating limitations are issued as one document with Phase I and Phase II limitations. SLSA aircraft do not have Phase I limitations since the aircraft manufacturer completes the flight test period. After assembly of a new experimental airplane, however, a test pilot (sometimes the owner himself) must fly the airplane for a minimum of 5 hours (with amateur built it will be 25-40 hours- the FAA or DAR

 U.S. Department of Transportation Federal Aviation Administration		Flight Standards District Office Sacramento		6650 Belleau Wood Lane Sacramento, CA, 95822 916-422-0272, Fax: 916-422-0482	
EXPERIMENTAL OPERATING LIMITATIONS Operating Light-Sport Aircraft Phase 1 <u>Operations in the Assigned Flight Test Area</u> <small>(These limitations are derived from the national standards contained in FAA Order 8130.2F, 114952004)</small>					
REG. NO.	MAKE:	MODEL:	SERIAL NO.:		
N123XX	Joe Aviator	MXL Sport II	000XXX		
NOTE: No person may operate outside the assigned flight test area prior to the completion of phase 1 flight testing. This includes the entry in the aircraft maintenance records as required by limitation #6.					
<p>(1) No person may operate this aircraft for other than the purpose of meeting the requirements of § 91.319(b) during phase I flight testing and, for the purpose of operating light-sport aircraft, after meeting these requirements as stated in the program letter (required by § 21.193) for this aircraft. In addition, this aircraft must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(e). These operating limitations are a part of Form 8130-7, must be carried in the aircraft at all times, and must be available to the pilot in command of the aircraft.</p> <p>(2) This aircraft must display the word "experimental" in accordance with § 45.23(b).</p> <p>(3) This aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation. The owner/operator of this aircraft must obtain written permission from another CAA before operating this aircraft in or over that country. That written permission must be carried aboard the aircraft together with the U.S. airworthiness certificate and, upon request, be made available to an ASI or the CAA in the country of operation.</p> <p>(4) Application must be made to the geographically responsible FSDO or MIDO for any revision to these operating limitations.</p> <p>(5) During phase I flight testing to meet the requirements of § 91.319(b), or as a result of the incorporation of a major change, all flights must be conducted within: <u>a 25 nautical mile radius of the Corning municipal airport, Corning, CA. Excluding all class "D" and surface based class "E" airspace at the Red Bluff and Chico airports.</u></p>					

may issue more flight test time in the interest of safety.) The purpose of the flight test period is to show that "the aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed; and that the aircraft has no hazardous operating characteristics or design features." (FAR 91.319b) This is referred to in the aircraft's operating limitations as the "Phase 1" Test Flight Period. The total number of hours required for Phase I are listed in each aircraft's operating limitations and flight test areas are assigned. The FAA order requires that the area be described by radius, or coordinates and/or landmarks. The designated area must be over open water or sparsely populated areas having light air traffic. The size of the area shall be that required to safely

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EXPERIMENTAL OPERATING LIMITATIONS Operating Light-Sport Aircraft Phase 2 <u>Operations outside the Assigned Flight Test Area</u> <small>(These limitations are derived from the national standards contained in FAA Order 8130.2F, 114952004)</small>					
REG. NO.	MAKE:	MODEL:	SERIAL NO.:		
N123XX	Joe Aviator	MXL Sport II	000XXX		
NOTE: No person may operate outside the assigned flight test area prior to the completion of phase 1 flight testing. This includes the entry in the aircraft maintenance records as required by limitation #6.					
<p>(1) No person may operate this aircraft for other than the purpose of meeting the requirements of § 91.319(b) during phase I flight testing and, for the purpose of operating light-sport aircraft, after meeting these requirements as stated in the program letter (required by § 21.193) for this aircraft. In addition, this aircraft must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(e). These operating limitations are a part of Form 8130-7, must be carried in the aircraft at all times, and must be available to the pilot in command of the aircraft.</p> <p>(2) This aircraft must display the word "experimental" in accordance with § 45.23(b).</p> <p>(3) This aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation. The owner/operator of this aircraft must obtain written permission from another CAA before operating this aircraft in or over that country. That written permission must be carried aboard the aircraft together with the U.S. airworthiness certificate and, upon request, be made available to an ASI or the CAA in the country of operation.</p> <p>(4) Application must be made to the geographically responsible FSDO or MIDO for any revision to these operating limitations.</p> <p>(5) During phase I flight testing to meet the requirements of § 91.319(b), or as a result of the incorporation of a major change, all flights must be conducted within: <u>a 25 nautical</u></p>					

conduct the type of anticipated maneuvers and tests, as appropriate. Passengers may NOT be carried during the Phase 1 Test Flight Period.

After successfully completing "Phase 1", the pilot must make a logbook entry and the aircraft enters into "Phase 2" of its operating limitations. During the remainder of the airplane's useful life, it will normally be operated under the same rules as most other privately owned/operated general aviation aircraft, unless the owner makes a major change.

There is a provision in the operating limitations of experimental aircraft (both ELSA and experimental amateur-built) that allows incorporation of a major change. So, what constitutes a major change? This would

be any modification that will change the previously tested flight characteristics of the aircraft. It may take the form of a different engine, different wing, or a modification to the airframe. Installing floats or a BRS, for example, would be considered a major change to the aircraft since the installation would appreciably effect both the weight and balance of the aircraft. After a major change to your aircraft, you would simply follow the guidance provided in the operating limitations in order to keep the aircraft legal. By the way- regardless of whether the aircraft is ELSA or experimental amateur-built or whether or not you are the builder of the aircraft, you can complete the modification yourself.

The operating limitations outline the process for experimental aircraft to be moved back into Phase 1 flight-test period. The primary restrictions regarding flight testing are: (1) no passengers, (2) day, VFR only, (3) no operation over congested areas, (4) you must advise ATC that you are experimental, and (5) the pilot must have the appropriate ratings. Of course, the general operating rules under FAR Part 91 are applicable. You may move your aircraft into and out of a flight testing regime any time you make a major change to that aircraft. You will do this with a simple logbook entry, then complete the required flight tests, for the required hours, in the assigned flight test area. Again, during the flight test period, you will not be allowed to carry passengers.

After you have successfully completed the testing, you will simply make another logbook entry and you can then return the aircraft to Phase II flight. The verbiage you should use to record the move from Phase I to Phase II and back to Phase I is called out in the aircraft's operating limitations. You should refer to the operating limitations for that individual aircraft in order to make sure you are making the correct entry in the records. When you sign the aircraft back into Phase II operation you will be stating the maximum weight and speeds you tested and also the minimum speed tested.

4 Your operating limitations may be changed, updates, or amended. Updating your operating limitations is a paperwork procedure that usually does not require a reinspection of your aircraft. There are several reasons why you might need to update your operating limitations.

Engine Log book entry		Page 1 8-10-2008
I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its normal range of speeds and throughout all maneuvers to be executed, has no hazardous operating characteristics or design features, and is safe for operation. The flight test was completed under the following conditions:		
Maximum operating weight _____		
Maximum demonstrated airspeed _____		
Minimum demonstrated stall speed _____		
Joe Aviator _____		
Certificate # _____		

First, the FAA order 8130.2F has changed over time. These changes have updated the limitation section in several ways for Light-Sport aircraft. The last change was released on 04/18/2007. If your operating limitations were issued before this you can contact the FAA inspector or DAR

who did the original certification and ask for a recurrent certification. This will result in the issuance of a new airworthiness certificate and operating limitations in accordance with the new changes to the order.

Second, you may need to request a new flight test area. This is common and must be done when, for example an aircraft is sold and the new owner lives in another geographic area or the original owner moves to a new area. If the original flight test period has not been completed or the owner makes a modification requiring that the aircraft be moved back into Phase 1, then a new test flight area will need to be assigned. Again, you would contact your FAA inspector at your local Flight Standards District Office and requested a new geographical flight test area.

Third, some experimental light sport aircraft have been issued operating limitations allowing for rental for the purpose of flight instruction until January 31, 2010. These operating limitations must be amended before the January 31, 2010 deadline or the aircraft will not be legal to fly. There are several important points to be aware of concerning the January 31, 2010 deadline;

1. All ELSA trainers must have the operating limitations and airworthiness certificates amended before the January 31, 2010 deadline. They will then be able to be flown for personal use.

2. After the deadline we will no longer be able to use ELSA for flight training, however- they can still be used for towing. If an ELSA is used for towing for hire, it will still require a 100 inspection.

3. Only the FAA inspectors can amend an airworthiness certificate- not DARS. DARS are only authorized to issue original/recurrent special airworthiness certificates.

Also worth mentioning here are aircraft originally certified as SLSA, but subsequently re-certified as ELSA to eventually allow for easier maintenance, alteration, and inspection requirements, per FAR 21.191(i)(3)- the "(i)(3) ELSA." Moving an SLSA to ELSA will require changes to the aircraft's placards, the size of the N number, an aircraft inspection, and the issuance of a new airworthiness certificate and operating limitations. You'll have to balance the depreciation of the aircraft and additional insurance costs with the benefits of the reduced maintenance and inspection requirements. (Currently -the aircraft would still need to be maintained as if it were still an SLSA, but that rule is expected to be changed in the next 6-8 months) Once moved to the ELSA category the aircraft may not be used for rental or flight instruction.

All maintenance and inspections required will be outlined in your operating limitations. SLSA aircraft will be required to have 100 hour inspections when being used commercially in a flight school, and will also be re-

quired to have a condition inspection performed each 12 calendar months (regardless of whether it's being used for commercial activity). The aircraft will need to be maintained by a person with a LSA repairman certificate with a maintenance rating or a qualified A&P mechanic (if the aircraft has a Rotax engine- then the A & P must have Rotax specific training)

Maintenance on an experimental light sport can be performed by anyone. The person doing the maintenance does not have to be the builder, and does not have to hold any FAA certificate of any kind. However- the operating limitations will require that your experimental aircraft have a condition inspection once a year and that the aircraft is found to be in a condition for safe operation. As part of the condition inspection, cockpit instruments must be appropriately marked and needed placards installed in accordance with FAR 91.9. In addition, system-essential controls must be in good condition, securely mounted, clearly marked, and provide for ease of operation. After the inspection is complete a logbook entry must be made. The verbiage you should use to record a condition inspection in the aircraft maintenance records is called out in the aircraft's operating limitations. You should refer to the operating limitations for that individual aircraft in order to make sure you are making the correct entry in the records.

So, as I said, operating limitations will call out who may perform the inspection and maintenance on the aircraft, listing an appropriately repairman. FAR 65.107 describes who may obtain the repairman's certificate. Repairman training is offered for both SLSA (120 hours) and ELSA (16 hours) by Rainbow Aviation Service- see www.rainbowaviation.com for further details.

Knowing more about your operating limitations is essential for aircraft owners. Knowing about the specifics of your aircraft limitations for normal flight, maintenance procedures, major modifications, and all other limitations that you must follow in order to retain the airworthiness certificate for your aircraft is vital. Read your operating limitations in their entirety and ask questions about those you do not understand.

If you have comments or questions about this article, send e-mails to info@rainbowaviation.com