A&P's and the Non-Type Certificated Aircraft

VAN'S AIRCRAFT

Bio

- Scott McDaniels
- A & P and Private Pilot
- Employed at Van's Aircraft Inc. (24 years)
- Head of Engineering Prototype Shop

What is a non-Type Certificated aircraft?

What is a non-Type Certificated aircraft?

- Any Aircraft that has been issued a SPECIAL (FAA Form 8130-7), instead of a STANDARD (FAA Form 8100-2) Certificate of Airworthiness

U.S. Department of Transportation
Federal Aviation Administration

APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI, and VII as applicable.

I. AIRCRAFT DESCRIPTION

1. REGISTRATION MARK	2. AIRCRAFT BUILDER'S NAME *(Make)*	3. AIRCRAFT MODEL DESIGNATION	4. YR. MFR.	FAA CODING
5. AIRCRAFT SERIAL NO.	6. ENGINE BUILDER'S NAME *(Make)*	7. ENGINE MODEL DESIGNATION		
8. NUMBER OF ENGINES	9. PROPELLER BUILDER'S NAME *(Make)*	10. PROPELLER MODEL DESIGNATION	11. AIRCRAFT IS *(Check if applicable)* ☐ IMPORT	

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A 1 ☐ STANDARD AIRWORTHINESS CERTIFICATE *(Indicate category)* ☐ NORMAL ☐ UTILITY ☐ ACROBATIC ☐ TRANSPORT ☐ COMMUTER ☐ BALLOON ☐ OTHER

B ☐ SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*

- **7** ☐ PRIMARY
- **9** ☐ LIGHT-SPORT (Indicate Class) ☐ Airplane ☐ Power-Parachute ☐ Weight-Shift-Control ☐ Glider ☐ Lighter than Air
- **2** ☐ LIMITED
- **5** ☐ PROVISIONAL *(Indicate class)*
  - 1 ☐ CLASS I
  - 2 ☐ CLASS II
- **3** ☐ RESTRICTED *(Indicate operation(s) to be conducted)*
  - 1 ☐ AGRICULTURE AND PEST CONTROL
  - 2 ☐ AERIAL SURVEY
  - 3 ☐ AERIAL ADVERTISING
  - 4 ☐ FOREST *(Wildlife conservation)*
  - 5 ☐ PATROLLING
  - 6 ☐ WEATHER CONTROL
  - 0 ☐ OTHER *(Specify)*
- **4** ☐ EXPERIMENTAL *(Indicate operation(s) to be conducted)*
  - 1 ☐ RESEARCH AND DEVELOPMENT
  - 2 ☐ AMATEUR BUILT
  - 3 ☐ EXHIBITION
  - 4 ☐ AIR RACING
  - 5 ☐ CREW TRAINING
  - 6 ☐ MARKET SURVEY
  - 0 ☐ TO SHOW COMPLIANCE WITH THE CFR
  - 7 ☐ OPERATING *(Primary Category)* KIT BUILT AIRCRAFT
  - 8 ☐ OPERATING LIGHT-SPORT
    - 8A ☐ Existing aircraft without an airworthiness certificate & do not meet § 103.1
    - 8B ☐ Operating Light-Sport Kit-built
    - 8C ☐ Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190
  - 9 ☐ UNMANNED AIRCRAFT
    - 9A ☐ RESEARCH AND DEVELOPMENT
    - 9C ☐ CREW TRAINING
    - 9B ☐ MARKET SURVEY
- ☐ SPECIAL FLIGHT PERMIT *(Indicate*
  - 1 ☐ FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE
  - 2 ☐ EVACUATE FROM AREA OF IMPENDING DANGER

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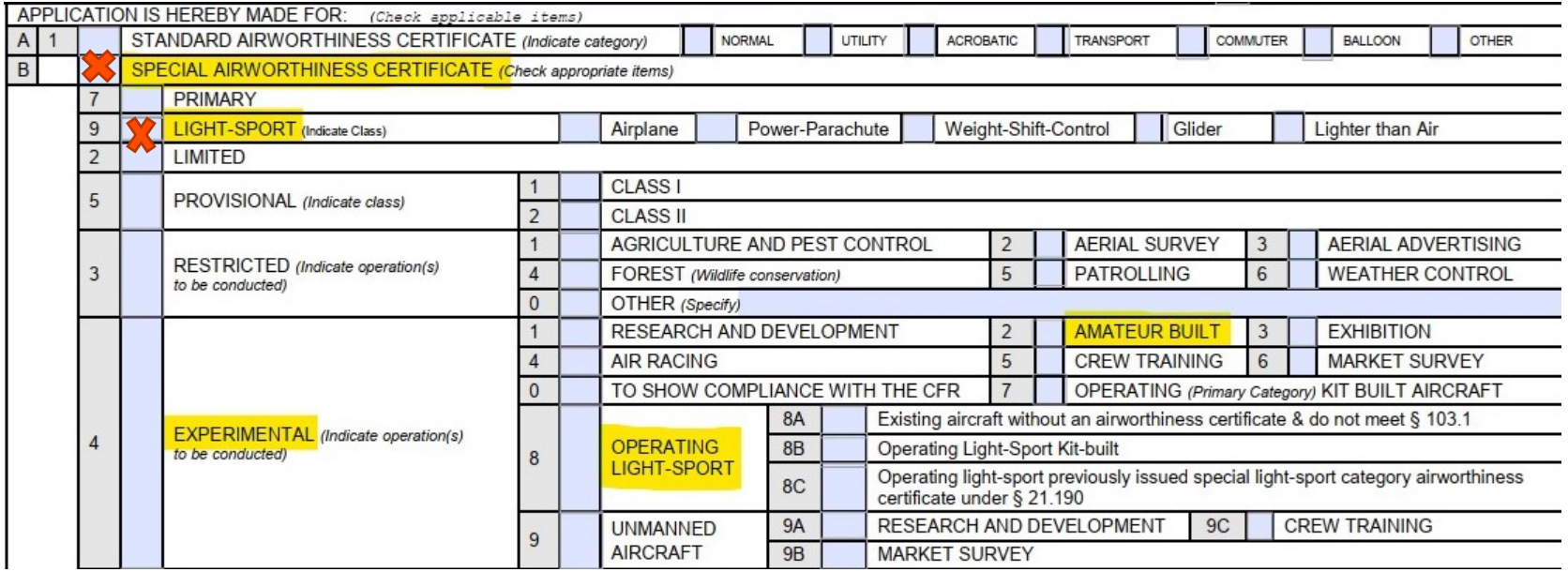

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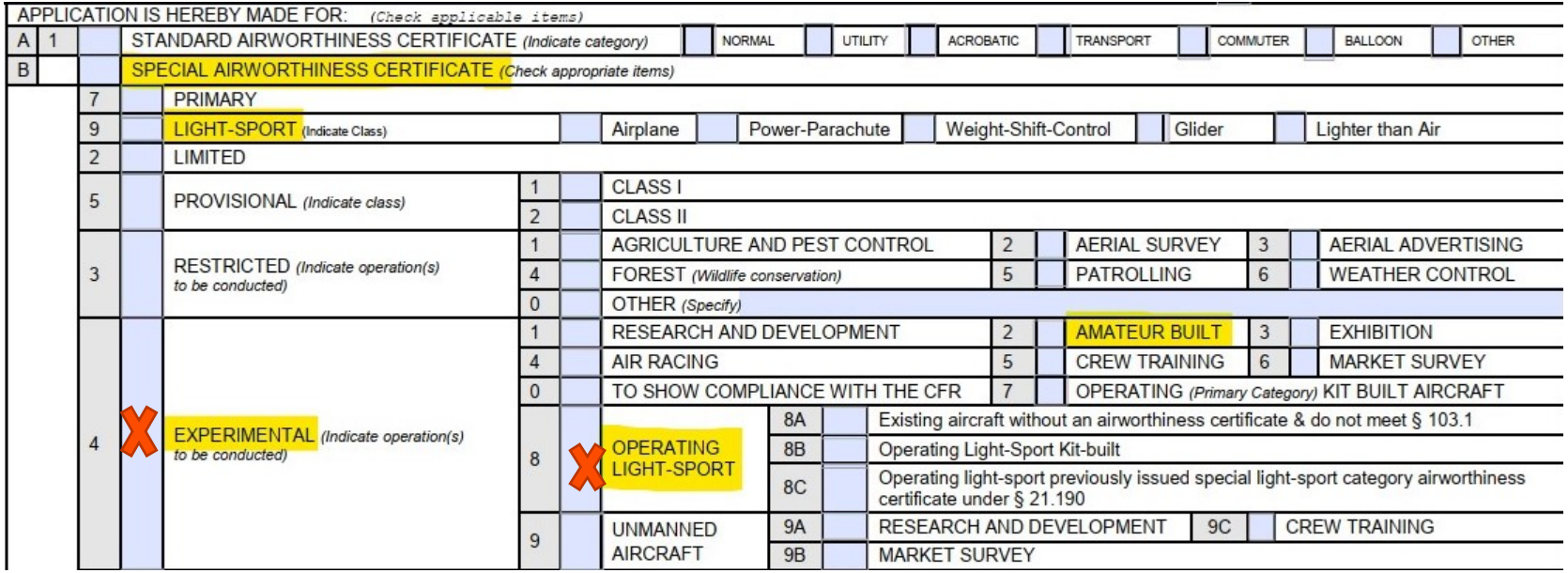
- **Special Light-Sport** - Built by a manufacturer / meets an ASTM consensus standard certification



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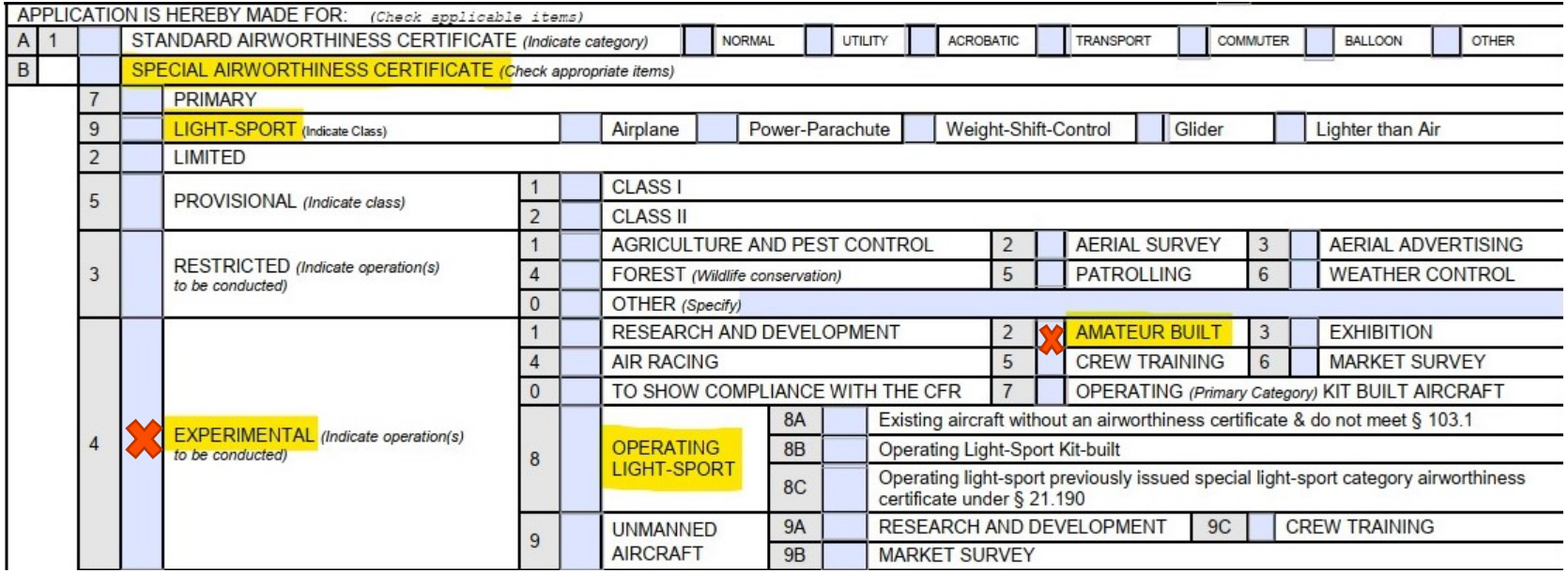
- **Experimental, Operating Light-Sport** - Not built entirely by a manufacturer but still a clone copy of an SLSA, or a former SLSA that may no longer meet a consensus standard.



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- **Experimental, Amateur Built** - Major portion built by an individual for their own education and recreation

Special Light-Sport Aircraft (SLSA)

- An aircraft certified by the manufacturer to meet the LSA industry consensus standard as spelled out in applicable ASTM's and then issued an Airworthiness Certificate in accordance with CFR 21.190
  - Max. take-off weight of 1320 lbs (1420 for sea planes)
  - Max. stall speed (with use of no lift enhancing devices) of 45 Kts (at gross weight)
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  - Limited to single (reciprocating) engine
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    2. A desire to reduce the level of certification required to do maint. / repairs, and condition inspections

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- This is typically done for one (or both) of the following reasons
  1. A desire to do modifications
  2. A desire to reduce the level of certification required to do maint. / repairs, and condition inspections

  The trade-off is that it can no longer be used for commercial operations (rented by a flight school for flight training, etc.)

Experimental Amateur Built

- An aircraft constructed by an individual (or group of individuals) “for their own education and recreation” (Which makes it eligible for certification under CFR 21.191)

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- There are limitations on how much professional (paid for) construction assistance is allowed
- There are no regulations limiting configuration or performance - only that construction be done using standard aircraft practices
- Because of the above, no two examples of any given make/model (even if built from commercially available plans or kits) will be the same

Playing by the rules

Rules (Regulations) as they specifically apply, or don't apply, to ***SPECIAL*** Airworthiness aircraft.

Playing by the rules

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2. Because of #1 above, there is no FAR stipulated certification requirements for who can do maint., repairs or inspections on EAB or ELSA aircraft, including major repair and overhaul of the engine, airframe, or any other components. Meaning, an owner can do any work they wish (except for a condition inspection), without having any certification (Repairman's Certificate., etc.)

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- There are regulations in FAR 43 that do relate to mechanic certification requirements for an SLSA regarding maintenance and repairs because it is not experimental.

Playing by the rules (continued)

- In order to, in essence, reapply specific requirements or add additional ones that are not addressed in the FAR's (some, but not all are covered in FAR 91.319), to aircraft with *SPECIAL* C of A's, they are issued ***Operating Limitations*** that are part of the C of A, and they must be in the aircraft to be considered approved for flight (it is fairly common for them to be missing). With the more recently issued documents (within the past 2 years or so) the C of A and operating limitations are printed all as part of the same document to try and reduce the instances of the limitations becoming lost.

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- One of many points of the Operating Limitations, is to reapply requirements related to the Who, What, and When, regarding the yearly inspection required to confirm the AIRCRAFT is in a "condition for safe operation."

Playing by the rules (continued)

- The operating limitations also specify what wording should be used when making the Maintenance Records entry for a condition inspection.

Playing by the rules (continued)

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- FAR 91 subpart C applies to all civilian aircraft, so any requirements within, that are related to continued airworthiness also apply to aircraft with a Special Certificate of Airworthiness.

Playing by the rules (continued)

- The operating limitations also specify what wording should be used when making the Maintenance Records entry for a condition inspection.
- FAR 91 subpart C applies to all civilian aircraft, so any requirements within, that are related to continued airworthiness also apply to aircraft with a Special Certificate of Airworthiness.

Examples

Playing by the rules (continued)

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- Executing and documenting the required 12 month ELT inspection. (FAR 91.207)

Playing by the rules (continued)

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- Control and instrument marking/placarding requirements (FAR 91.9)

Playing by the rules (continued)

Examples

- Executing and documenting the required 12 month ELT inspection. (FAR 91.207)
- Control and instrument marking/placarding requirements (FAR 91.9)
- Semi-annual (every 24 months) inspection of Transponder/Altitude Reporting equipment (FAR 91.413), and Static System / Altitude Reporting in section if used for IFR flight (FAR 91.411)

Playing by the rules

- For ELSA's The operating limitations specify -

That ***"a condition inspection must be done in accordance with FAR 43, Appendix D or the manufacturers inspection procedures."***

LSA do have manufacturers inspection procedures so they must be used. To do that, you need a copy of those procedures. So it should be confirmed that a copy of the Maint. Manual / Inspection Procedures is available before beginning an inspection. (As part of an SLSA's certification, a Maintenance Manual has to be produced, which besides the typical info you would expect, also has an inspection procedures section and a line item check list. Because of the operating limitation, this must be used when conducting a condition inspection on any LSA).

Playing by the rules

- For ELSA's The operating limitations specify -

That ***"The aircraft maintenance records entry will include the aircraft's total time-in-service (cycles if appropriate), and the name, signature, certificate number, and type of certificate held by the person performing the inspection."***

Playing by the rules

- For ELSA's The operating limitations specify -

An ELSA owner/operator certificated as a repairman for this aircraft under § 65.107, an appropriately rated FAA-certificated mechanic, or an appropriately rated FAA repair station may perform the condition inspection required by these operating limitations

An A&P is considered an appropriately rated FAA-certificated mechanic.

Note: IA is not required and should not be part of the log book entry.

(IA is only relevant to **Type Certificated Aircraft**)

Playing by the rules

- For SLSA's

There is no operating limitation stipulating certification or procedure requirements for doing work or inspections on an SLSA because it is not experimental, and it **does** have relevant content in FAR 43

An A&P is considered an appropriately rated FAA-certificated mechanic.

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(IA is only relevant to **Type Certificated Aircraft**)

Playing by the rules

- For Experimental Amateur Built, the operating limitations specify –

That a ***"condition inspection must have been done within the previous 12 calendar months, within the Scope and Detail of FAR 43, Appendix D, manufacturer or other FAA-approved programs, and was found to be in a condition for safe operation"***

There typically are no manufacturers inspection procedures for an E-AB aircraft so the actual process defaults to using FAR 43, Appendix D, so the actual process is up to the person doing the inspection but using some type of checklist that is based on Appendix D is a good idea.

The checklist in **AC 90-89B** would be an FAA approved example if you don't have any other that would be appropriate.

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- For Experimental Amateur Built, the operating limitations specify –

That ***"The aircraft maintenance records entry will include the aircraft's total time-in-service (cycles if appropriate), and the name, signature, certificate number, and type of certificate held by the person performing the inspection."***

Playing by the rules

- For Experimental Amateur Built, the operating limitations specify –

An experimental aircraft builder certificated as a repairman for this aircraft under § 65.104, or an appropriately rated FAA-certificated mechanic, may perform the condition inspection required by these operating limitations.

An A&P is considered an appropriately rated FAA-certificated mechanic.

Note: IA is not required and should not be part of the log book entry.

(IA is only relevant to **Type Certificated Aircraft**)

Additional details for an SLSA (Special Light Sport Aircraft)

Additional details for an SLSA

- An SLSA aircraft is as close to a Type-Certificated aircraft as one with a Special C of A can get, so it has most of the same limitations in regards to modifications from its original certificated configuration, certifications for who can do maint. or inspections on it, etc.

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- A Maintenance Manual is issued with each new aircraft and is part of the aircraft specific documentation (it should be provided by the owner when any Maintenance or Inspections are contracted).

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- A Maintenance Manual is issued with each new aircraft and is part of the aircraft specific documentation (it should be provided by the owner when any Maintenance or Inspections are contracted).
- As already mentioned, because of its level of certification, it should always be configured as it was when originally delivered by the manufacturer unless there is supporting documentation for the changes.

Additional details for an SLSA

- If there have been any manufacturer approved modifications, or compliance with any Safety Directives, Safety Alerts, or Service Bulletins performed, they should be documented with pages added to the back of the Maintenance Manual and an entry added to the table of contents page at the front, along with appropriate entries in the Aircraft Maintenance Records (log book).

Additional details for an SLSA

- If there have been any manufacturer approved modifications, or compliance with any Safety Directives / Alerts, or Service Bulletins performed, they should be documented with pages added to the back of the Maintenance Manual and an entry added to the table of contents page at the front, along with appropriate entries in the Aircraft Maintenance Records (log book).
- Any work or inspections done beyond the standard owner approved maint. described in FAR 43 Appendix A must be done by an A&P or Light Sport Repairman-Maintenance (A certificate similar to an A&P but specific to LSA only…. Is obtained by taking a 120 hr training course).

Additional details for an ELSA (Experimental Light Sport Aircraft)

Additional details for an ELSA

- Originally built as a clone copy of an SLSA (no modifications or deviations from the assembly instructions are allowed before certification)

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Additional details for an ELSA

- Originally built as a clone copy of an SLSA (no modifications or deviations from the assembly instructions are allowed before certification)
- May have had some modifications done (after original certification), which might or might not have been designed/endorsed by the manufacturer.
- Any modifications that have been done must not have changed the performance or configuration details outside of the limitations for Light Sport Aircraft.

Additional details for an ELSA

- Originally built as a clone copy of an SLSA (no modifications or deviations from the assembly instructions are allowed before certification)
- May have had some modifications done (after original certification), which might or might not have been designed/endorsed by the manufacturer.
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- Maintenance, Repairs, and Modifications can be accomplished by anyone.

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- Originally built as a clone copy of an SLSA (no modifications or deviations from the assembly instructions are allowed before certification)
- May have had some modifications done (after original certification), which might or might not have been designed/endorsed by the manufacturer.
- Any modifications that have been done must not have changed the performance or configuration details outside of the limitations for Light Sport Aircraft.
- Maintenance, Repairs, and Modifications can be accomplished by anyone.
- The Annual condition inspection can be done by an A&P, an appropriately rated FAA repair station or an owner with Light Sport Repairman-Inspector (16 hr training course available to anyone).

Additional details for an E-AB (Experimental Amateur Built Aircraft)

Additional details for an E-AB

- No design or performance limitations

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- No design or performance limitations
- Maintenance, Repairs, and Modifications can be accomplished by anyone.
- Typically no Illustrated Parts or Maintenance Manual exists. If built from a kit, the kit build manual is a good reference for use as an IPC and Maint. Manual, so request that the client deliver them with the airplane when contracting to do an inspection.

Additional details for an E-AB

- No design or performance limitations
- Maintenance, Repairs, and Modifications can be accomplished by anyone.
- Typically no Illustrated Parts or Maintenance Manual exists. If built from a kit, the kit build manual is a good reference for use as an IPC and Maint. Manual, so request that the client deliver them with the airplane when contracting to do an inspection.
- An experimental aircraft builder certificated as a repairman for this aircraft under § 65.104, or an appropriately rated FAA-certificated mechanic, may perform the condition inspection required by the operating limitations (from the Operating Limitations).

Why is an A&P needed for a condition inspection?

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Typically because the aircraft owner doesn't have the required level of certification needed.

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Most common with second-owner EAB aircraft because the owner is not eligible for a Repairman's Certificate.

Also common with SLSA aircraft because owners don't typically have a Light Sport Repairman – Maintenance Certificate

Why A&P, and not IA?

Why A&P, and not IA?

- An IA inspects an aircraft to evaluate its condition and **confirm it is in compliance with its original Type Certificate**.

SLSA and Experimental Aircraft are not certificated under a Type Certificate, so there is no Type Certificate standard to evaluate them against.

The FAA maintains a very distinct separation between Normal (Type Certificated) and Special airworthiness aircraft.

Example: A special C of A aircraft is never referred to as airworthy. They are only referred to as being in a condition for safe operation (The inspection sign-off the inspector makes states that)

Inspection preparation

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- Research Bulletins / Notifications issued by Kit manufacturer (If applicable)

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- Research Bulletins / Notifications issued by other parts manufacturers
- Investigate Software / and database updates for avionics
- Investigate FAA issued AD's that may apply to components on the aircraft

Do FAA issued AD's (by regulation) apply to Experimental Aircraft?

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- Technically, no.

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- Technically, no.
- FAA has authority to issue an AD against any aircraft operating in U.S. airspace except under Part 129. FAA's ability to issue AD's is limited by practical considerations. The FAR do not support AD's for non-TC'ed aircraft. If FAA issues an AD against a non-TC'ed' aircraft, it could be challenged strongly in court for violating its own rules. AGC (FAA Legal Council) is adamant in this. FAA refrains from AD's' for experimental amateur-builts and foreign manufactured non-TC'ed' aircraft.

  (From an Aircraft Certification Management Team Report published in 1998)

Should FAA issued AD's be applied to Experimental category aircraft?

Should FAA issued AD's be applied to Experimental category aircraft?

- Yes

Remember that the certification statement for the completion of a condition inspection is ***"I certify that…… and was found to be in a condition for safe operation"***

The potential issues being addressed by the issuance of an AD are (usually) going to be as relevant on an experimental as they are on a Type Certificated aircraft. Because there is some latitude from a regulatory standpoint, a mechanic can use their own judgement if they choose to.

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What notifications apply to LSA?

For SLSA –

- Any Safety Directive or Safety Alert issued by a manufacturer automatically has a mandatory compliance.
- Any Service Bulletin issued by a manufacturer may have a mandatory compliance.
- Any Service Letter issued by a manufacturer is informational only, and not mandatory.

What notifications apply to LSA?

For ELSA –

- Just as with E-AB, because ELSA is experimental, manufacturer issued notifications are not (by regulation) mandatory for compliance.

But just like FAA issued AD's, can you certify an aircraft is ***"in a condition for safe operation"*** with the knowledge that there are manufacturer issued Safety Directives or Safety Alerts uncompiled with?

Additional Resources

- EAA Webinar – Maintenance Gotchas
- Available on the Experimental Aircraft Association web site at

https://eaa.org/Videos/Webinars/Aircraft-Building/6115329634001

Additional Resources

For future reference –

A copy of this presentation can be accessed on the Van's Aircraft download page:

https://www.vansaircraft.com/downloads/

Wrap-up / General Comments

- Become familiar with the operating limitations of a particular aircraft. They will direct you regarding the specific details for completing and properly signing off the completion of a condition inspection

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- Become familiar with the operating limitations of a particular aircraft. They will direct you regarding the specific details for completing and properly signing off the completion of a condition inspection
- Utilize the service information available on manufacturers web sites
- Understand that because the FAA doesn't issue AD's on experimental aircraft, that Service Bulletins issued by manufacturers are just as important. Particularly when issued with a before further flight compliance requirement.

Wrap-up / General Comments (continued)

The major majority of LSA's use some version of the Rotax 912 engine. It is very different from the typical light aircraft engine that most A&P's are familiar with. Obtaining type specific training for this engine (or any other that an A&P has no prior experience with) before doing any maint. or repairs is required and highly recommended.

Wrap-up / General Comments (continued)

As A&P's, you have the opportunity to greatly impact the safety of people flying Experimental and LSA aircraft.

Many people have the certification to do condition inspections on their aircraft, but they might not have the practical experience to do them to the same level you probably can.