

Stinson 108 Buying Considerations
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By Larry Westin - July 16, 2005
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Certain areas should be examined for any airplane you purchase. Such as; airworthiness certificate, aircraft registration, log books, FAA form 337's etc. This article doesn't include those areas, rather what I want to do here is to emphasize areas of importance specifically to the Stinson 108 series of airplanes.

AIRPLANE SERIAL NUMBER

Stinson 108's have serial numbers at 5 different locations. The primary serial number for the Stinson 108 is stamped on the steel fuselage frame. Serial numbers are located at the following positions:

1 - The primary airframe serial number is on the copilots side facing the right peddle on the firewall exhaust mount. This number **MUST** match the serial number on the Data Plate, number 2 below. My thanks to Bob Harper <robertl@quesnelbc.com> for checking other Stinson 108's to verify the location of the frame serial number.

2 - Stinson Aircraft Data Plate - this is the official Stinson Division of Consolidated Vultee data plate bolted to the inside of the firewall. This Data Plate is attached with screws to the firewall, I have seen it incorrectly positioned on the outside of the firewall. The serial number on the Data Plate and the serial number stamped on the frame **MUST** match!! This is important!!

3 - Engine Firewall - stamped just below the top of the firewall on the right side (as viewed from the rear). This should match the serial number on the frame (1 above) and fuselage frame (2 above).

4 - Each wing has a serial number on the center flap hinge.

5 - The horizontal stabilizer has a serial number stamped on the horizontal stabilizer spar.

To meet current FAA regulations a data plate showing the serial number must also be on the outside of the airplane, generally at the leading edge of the horizontal stabilizer. This is the fuselage serial number. Stinson did not put this plate on the airplane. It is required and available from several companies so the exact location and style vary.

IMPORTANT - Stinson did NOT match serial numbers between the fuselage, wings and horizontal stabilizer. However it is important to check all these serial numbers. Normally the fuselage, wing and horizontal stabilizer serial numbers are within about 10 of each other.

If you find the difference large, say more than 20, suspect the airplane you are inspecting has been involved in an accident. It may in fact be several different airplanes combined to make a single airplane. There is nothing illegal about using parts from multiple airplanes to make one airplane - HOWEVER it does require substantiating paper work to explain in detail what was accomplished.

If you find a large serial number difference then locate the appropriate FAA form 337. If there isn't a FAA form 337 to document the work, then I'd give serious consideration to locating a different airplane to purchase.

Horizontal stabilizer serial number - physically a horizontal stabilizer from any Stinson 108 will fit on any other Stinson 108. My reason for emphasizing the horizontal stabilizer serial number is airworthiness directive 47-50-12. If your airplane is serial number 108-4968, and your horizontal stabilizer is also serial number 108-4968 (or close), then AD 47-50-12 does not apply. However if at some point the horizontal stabilizer on airplane 108-4968 was replaced with horizontal stabilizer 108-2576 (or any stabilizer with serial number 3500 or less), which fits fine, then AD 47-50-12 now applies to your airplane. This is not a major AD, but it needs to be installed if your airplane horizontal stabilizer is serial number 108-3500 or lower.

FUSELAGE LONGERON TUBING

Some Stinson 108's have problems in the fuselage longeron tubing near the tail wheel. Because the Stinson 108 is a tail wheel airplane, the tail sits low. The fuselage longerons are hermetically sealed at the factory with an inside coating of linseed oil for protection. If something occurred to damage a fuselage longeron allowing in air, that break in the hermetically sealed tubing will allow moisture inside the tubing. This moisture can remove the internal coating of linseed oil permitting rust to form on the tubing.

Inspect the fuselage longeron tubing carefully around the tail wheel area for any sign of rust. Any rust present is reason for a thorough inspection. This may require removing the fabric from tail area. When the fabric is removed it is possible to view this area with the extra attention it deserves extra. Use a small screwdriver to push against the fuselage longerons. If internal rust is present in the fuselage longeron you can detect it by pushing on the tubing with the small screw driver or other sharp tool.

When the fabric is replaced the fuselage longeron tubing should be bead (or sand) blasted to bare metal. Once cleaned to bare metal a complete inspection is possible. Shortly after the inspection be prepared to spray primer the tubing. The Stinson 108 uses 4130 steel tubing for the fuselage longerons. Once at the bare state 4130 steel rusts quickly, so get the primer on soon (within a few hours) after the bead/sand blasting and satisfactory inspection. My thanks to Cleland McBurney <sockeye@terraworld.net> for reminding me about the need to inspect the fuselage longeron tubing.

MAJOR MODIFICATIONS, ESPECIALLY METALIZING

Several Supplemental Type Certificates (STC's) exist to replace the fabric covering on the Stinson 108 with aluminum sheet metal. Some of these are actually approved on the Type Certificate Data Sheet rather than shown as a STC (not sure why they are not all listed as STC's). If the airplane you are considering for purchase has a major modification it is **VERY IMPORTANT** you obtain the supporting documentation with the airplane. I don't mean a log book entry, or even a FAA form 337, I mean the blue prints and other documentation provided by the seller of the STC modification.

Over the past few years several people have contacted me asking about what data I have for a metalized Stinson. Actually I don't have any, and several companies provided this type of modification. Their reason for asking is most often during an annual inspection the Airframe and Powerplant mechanic with Inspection Authorization wants that supporting documentation to prove the airplane is airworthy. The A&P/IA is asking because many local FAA Flight Standard District Offices (FSDO) are demanding this documentation. Canadian owners have also encountered this situation where the Transport Canada inspector also wants supporting documentation for STC's.

When the modification was performed the A&P did the work to a set of documented instructions. When complete the A&P makes a log book entry, and for major modifications it is inspected by an A&P/IA, a FAA form 337 is completed and sent to the FAA in Oklahoma City, Oklahoma. At this point all is fine. It is important to understand the FAA has only a FAA form 337 stating the work was accomplished according to documentation supplied by the STC holder. The A&P/IA does NOT send that documentation to the FAA, only the 337 saying the work was accomplished. So far so good.

Where the problem arises is the failure of many owners to comprehend the importance of keeping ALL supporting documentation and drawings. Too often this supporting documentation is lost.

Now assume the airplane is sold to someone who bases it on another field. Each year an annual inspection is required. So the new A&P/IA doing the annual inspection has never seen this modification before. For that person to state the airplane is airworthy they must confirm the modification was done correctly. This is where the essential need for that original documentation first surfaces. Some A&P/IA mechanics may not ask, others definitely do want that information.

Several times over the past 5 years people have contacted me asking for copies of that information. Now you would think the FAA office responsible for approving that modification would have the documentation, not necessarily. In one case an owner asked the FAA for the documentation, the FAA found the information, but could not provide it to the owner since it was owned by the company who obtained the STC. In that case the owner based a request to the FAA on a Freedom of Information Act

(FOIA) request. I never heard the final outcome of that request, but I do know the FAA couldn't locate the owner of the STC, then sent out messages for the owner to contact them. Last I heard if the owner didn't reply in 90 days the FAA would provide the documentation under the FOIA. Locating this supporting documentation can be difficult, time consuming, and in some cases impossible.

In one instance the FAA contacted me asking for documentation for a particular Stinson modification. A FAA inspector happened to visit a shop while an annual inspection was being performed on a metalized Stinson 108. In that case the owner didn't have the documentation, the FAA couldn't find it in their records, and in the end the owner had to pay a FAA designated engineering representative (DER) to perform a stress analysis on that airplane before the annual inspection could be completed. Keep in mind this airplane had been flying safely for literally decades with that modification.

There are many STC's shown for the Stinson 108 series airplanes. In many cases the names and addresses are no longer valid. They appear on the STC list because the STC is still valid, but the company may no longer exist, or if they are still in business they often don't support the STC any longer.

These STC's are still shown in the FAA STC list because they are legal, as long as you can support that your installation was performed to the STC specifications. For example several STC's exist to install the Lycoming O-435 engine in the Stinson 108 airplanes, but I don't think any of those companies who own these O-435 STC's continue to support it. The STC documentation is sold by the owner of the STC to the owner of the airplane. STC documentation is rarely if ever present at individual shops. It is very important for owners to understand how essential it is to have this supporting documentation. When you purchase a Stinson 108 (or any other certified airplane) make certain you as the new owner get ALL the supporting documentation for all the major modifications. If you don't you may well encounter a large cost in having a designated engineering representative confirm the installation.

VERY IMPORTANT - make sure ALL the documentation to support any major modification is included with the airplane when you purchase it. If you fail to understand this you may well expose yourself to a major expense in the future. It doesn't matter that the airplane has passed 20 annual inspections since installation of that modification, if the current inspector wants to see the supporting documentation be prepared to provide it.

WINGS

Check the main spars carefully. The spars are extruded aluminum and not easily repairable. If the spar is corroded it may well have to be replaced. An expensive proposition, take a look before buying to confirm the spars aren't corroded.

FUEL TANKS

Stinson built the model 108, 108-1 and 108-2 with 20 gallon fuel tanks. The model 108-3, 108-4 (never certified, but 1 was built) and 108-5 have 25 gallon fuel tanks. To accommodate the heavier weight of the 25 gallon tanks, Stinson also made changes to the fuselage structure. While the wing attach points are dimensionally identical, and therefore you can physically install 25 gallon fuel tank wings on an earlier Stinson 108, you cannot legally install wings with the 25 gallon fuel tanks on Stinson models 108, 108-1 and 108-2.

The Stinson 108 General Service Manual has a page which shows the fuselage tubing diameter and wall thickness for the different model 108's. Two illustrations are shown, one for the models 108, 108-1 and 108-2 (those models with 20 gallon tanks), and a second illustration for the model 108-3 (the 108-4 and 108-5 have the same fuselage structure as the 108-3, all with 25 gallon tanks). I've looked but cannot see the differences. One reason is that Stinson changed the labeling on the two drawings making it difficult to find the differences.

Regardless Stinson 108 documentation clearly states there are structural differences to accommodate the heavier weight of the 25 gallon tanks. If you have a model 108, 108-1 or 108-2 that has 25 gallon fuel tanks, your airplane is illegal. It may fly fine, but it is not legal, the fuselage structure isn't designed for these tanks. I've seen this occur one time, and at an annual inspection the airplane was grounded until replacement 20 gallon wings with tanks were found, purchased, recovered, and installed. Very expensive and time consuming. I recommend against buying or even flying any Stinson 108, 108-1 or 108-2 which has 25 gallon fuel tanks.

FRANKLIN ENGINE

Many shops do excellent work on the Franklin engine. But they are far fewer than shops which service Continental and Lycoming engines. If the work on your Franklin was performed by a shop in Underwood, Indiana, my recommendation is not to buy the airplane. To the best of my knowledge the individual is not licensed by the FAA, and the work is suspect. See FAA Advisory Circular AC 43-16 dated March 1993.

Note that the Data Plate, serial number 2 above, will also have the serial number of the original Franklin engine installed at the factory.

MAKE CERTAIN THE AIRPLANE IS ON THE FAA REGISTER

Just because it has a N number painted on the airplane, that doesn't necessarily mean it is registered with the FAA. That N number may be the registration number assigned when the airplane was built, again that doesn't mean the airplane is still registered.

Beginning in the late 1970's the FAA began sending out Tri Annual reports to owners.

The FAA did that if they had not received some type of paperwork, such as an annual inspection from your IA, or a 337 indicating a change, for the airplane for 3 years, the FAA considers the airplane inactive. If the owner returned the card the airplane remained registered. If the owner failed to complete and return the card the FAA removed that airplane from the FAA registry. Once removed the N number may well be assigned by the FAA to another airplane.

I recommend having an aircraft title search performed before purchase of the airplane. You can contact the Aircraft Owners and Pilot's Association (AOPA) who perform this service for a nominal fee. This will tell you if the owner trying to sell the airplane to you really owns the airplane outright, or if someone else has a lien on the airplane. When you buy the airplane you want it to be yours.

GENERAL RECOMMENDATIONS

Contact the FAA in Oklahoma City and purchase their copy of the airplane records. It is very inexpensive. Today those records come on a CD-ROM (assuming the airplane is currently on the FAA register), in Adobe Acrobat PDF format. Well worth the effort to obtain.

Check the FAA online at URL

https://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/copies_aircraft_records/ to obtain what records the FAA has for the airplane.

If the airplane was removed from the registry the FAA stores records for these airplanes at an outside location, and in cases of older airplanes they may be paper copies only. You can still get them but it will take longer.

Good Luck with your purchase.

If you have points I've missed please contact me.

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