SERVICE BULLETIN 131

SUBJECT: Fuel Venting Overboard

APPLICATION: All Glasair aircraft without the Fuel Vent Float Valves installed, (Super II-S kit numbers after 2349 and G-III kit numbers after 3295 are shipped with the Fuel Vent Float Valves).

DESCRIPTION: The Glasair aircraft, with a wing dihedral of only 3° and a single, long wing fuel tank (extending from wing tip to wing tip), is subject to venting of fuel out the wing tank vent lines when the aircraft is situated in a position with one wing tip lower than the other. The situation is most pronounced with the wings full of fuel and with the standard fuel system vent lines described in the instruction manuals. Once fuel enters the vent lines, a siphoning action through the vent lines can occur, which can only be stopped by raising the low wing tip and introducing air into the fuel cell (most easily done by removing the gas cap). Once fuel vent siphoning begins, unless corrective action is taken, significant fuel loss can occur.

Siphoning is not a problem for header tanks, but placement of the header tank vent line too low or to far aft on the tank can lead to increased chance of fuel venting overboard.

CAUTION: Fuel vapors from spilled fuel can be ignited by an engine exhaust after-fire. Pilots should be very strict in observing proper operational procedures by pulling the aircraft away from any pools of fuel that may have spilled on the ground before attempting to start their engine.

A Glasair was recently destroyed by fire when the pilot failed to move the aircraft from a fuel vent spill comprising about 15 square feet. Because proper pre-flight procedures are not always observed, owners are strongly urged to adopt the best risk reduction alternative they feel their time and budget will allow.

RECOMMENDED ACTION: Several different methods have been used by builders to reduce the risk of fuel venting overboard. The best and most effective recommendations are listed first, with alternative recommendations following in successive order.

RISK REDUCTION MEASURES	RESULTING EFFECT
1. Installation of Fuel Vent Float Valve Kit (wing tanks only with or without tip extension fuel tanks)	Will generally eliminate fuel venting overboard
2. Installation of anti siphon tubes (wing tanks only; not to be used with tip extension fuel tanks). This alternative is possible only if the standard stand pipe fuel gauge is not installed.	Will minimize the amount of fuel venting out
3. Locate the vent ports as high as possible within fuel tanks (wing and header tanks).	Will minimize the possibility of fuel venting overboard

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RISK REDUCTION MEASURES	RESULTING EFFECT
4. Make custom winglets to raise the vent above the wing (Stoddard-Hamilton has not developed any winglets nor does it offer technical assistance for such a modification).	Can help eliminate fuel venting overboard based on winglet design (May be a source for rain water to enter the tank)
5. Taking care to avoid having one wing low during fueling and parking, and to avoid overfilling the fuel tanks.	Will minimize risk of fuel venting overboard

1. The Fuel Vent Float Valve (FVFV) installation (332-0490-501) is the most effective way to prevent fuel from entering the vent system. The system is designed primarily for the Glasair II-S, Super II-S, and Glasair III, but installation procedures are available for other models as well. The FVFV installation has proven effective to prevent siphoning and can also be used in conjunction with wing tip extensions used as fuel tanks.

2. Builders using the Vision Microsystem capacitance probe fuel level system can opt for a less effective but simpler remedy for fuel vent siphoning by incorporating an anti-siphon tube in the wing tip vent line. The anti-siphon tube (not to be used with extended tip tanks) is simply a small diameter tube attached to the regular vent line at each wing tip. The anti-siphon tube will act to prevent any siphon action created by the standard vent exit being lower than the bottom of the fuel tank. The small anti-siphon tube will still allow fuel to over flow onto the ground when a wing is low. As soon as the wing tip is raised, air will enter the tank through the vent line allowing the fuel level to fall below the fuel vent opening inside the tank. This will minimize the amount of fuel that spills onto the ground.

WARNING: This system should not be used in conjunction with the standard stand pipe fuel gauge due to the effect it may have on accurate fuel level readings. Also, this system is not an alternative when wing tip extensions used as fuel tanks are installed.

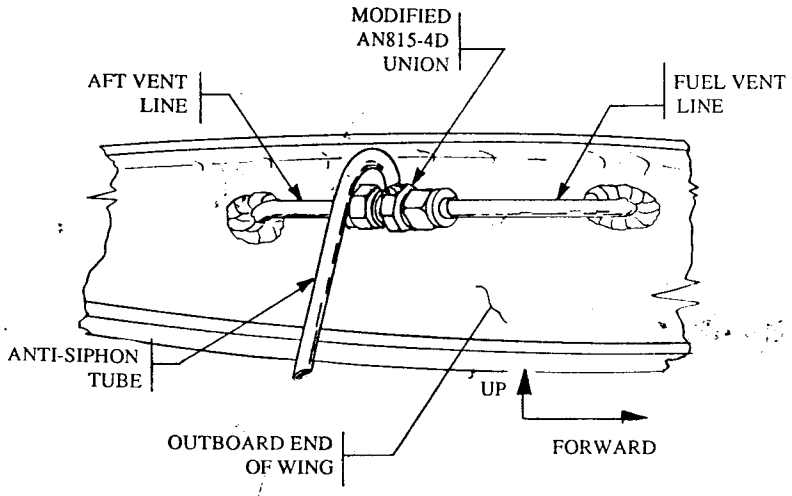

FIGURE (1)

A sample anti-siphon tube installation is shown in FIGURE (1). This installation uses a modified AN815-4D union fitting and a 3/16" Dia. 5052-O aluminum tube. Drill a 1/8" hole through one flat into the union passageway. Weld the tubing over the hole (as illustrated in FIGURE 1) to form an air entry source at the highest point in the vent line. Form the tube to loop up as high as the inside upper skin will allow and then back down to exit through the lower skin.

NOTE: The anti-siphon tube system is still susceptible to fuel flowing overboard (but not siphoning) when one wing is low and the fuel level rises above the vent opening inside the tank.

If sufficient customer interest exists Stoddard-Hamilton Aircraft will manufacture these anti-siphon units. If interested, please contact the order desk by February 28, 1995, so a production run can be planned. Refer to Anti Siphon Tube #332-0815-101.

3. The vent lines are typically located in the highest corner of the fuel cell. Sometimes the vent line can be bent upward or cut at an angle (as is done with the wing vent design on the II-S, Super II-S, and III). This is not always possible and the small raising of vent port height will only slightly increase the angle the wing can tilt before fuel enters the vent lines.

4. Many builders have developed winglets that offer the advantage of significantly increasing the outboard height the wing vent line. The primary disadvantage of this system is the complexity of designing and building this surface. It is an airfoil and will affect the flight characteristics of the airplane. It also significantly effects the overall looks of the aircraft and can be a source for rain water to enter the tank while parked.

5. To avoid fuel spills, pilots must take extra care to level the aircraft prior to fueling. The fueling operation should be done carefully. Fuel from both wings alternately to allow time for the fuel to transfer through the fuel tank baffles and to avoid over filling that may result in fuel spilling out of the vent lines on the low wing side. Sufficient fuel expansion space should remain in the tanks in case a temperature change causes the fuel to expand, which may result in a fuel spill.