

## GlaStar Sportsman Service Bulletin 68

**Subject:** Fuel Tank Vents and Icing

**Applicability:** All GlaStar and Sportsman Aircraft

**Issue:** Reduced Risk of Fuel Vent Blockage In Icing Conditions

### **Discussion and Background Information:**



**WARNING:** Flight in icing conditions is prohibited in Glastar and Sportsman aircraft. As set forth in your Pilot Operating Handbook/Owner's Manual, these aircraft are not to be exposed to icing encounters of any intensity. If the airplane is inadvertently flown into icing conditions, the pilot must make an immediate diversion by flying out of the area of visible moisture or going to an altitude where icing is not encountered. These precautions apply to any aircraft without operational anti-ice and/or deice equipment.

*FAR Part 23 Airworthiness Standards, Subpart E--Powerplant Fuel System (Sec. 23.975) states:*

- (a) Each fuel tank must be vented from the top part of the expansion space. In addition—*
- (1) Each vent outlet must be located and constructed in a manner that minimizes the possibility of its being obstructed by ice or other foreign matter;*



**Note:** Although certified aircraft requirements do not apply to amateur build aircraft, Glasair Aviation gives consideration to FAR 23 certification standards for airframe and systems design.

The current method of routing and terminating the Glastar and Sportsman fuel tank vent tubes overboard may not satisfy item 1 above. Therefore, if you fly in conditions which you believe may result in inadvertently encountering icing conditions, you should consider modifying or moving your fuel tank vents to further minimize the possibility of their becoming obstructed by ice or other foreign matter.

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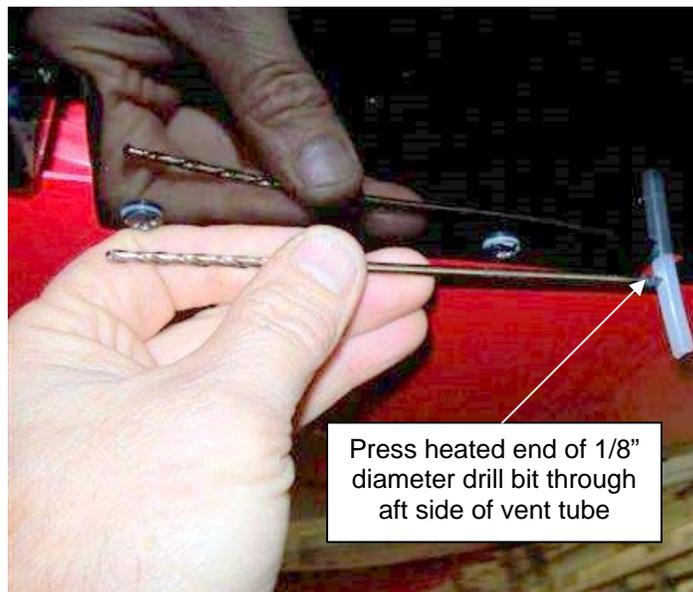
**WARNING:** Without flight testing in actual icing conditions, there is no way to determine if any particular fuel vent installation will function properly in icing conditions. The installations noted below have not been tested under icing conditions; thus, we cannot say for certain that they will function properly in any icing condition.

**Suggested Action:**

We suggest that, as an added degree of ice protection, all Glastar and Sportsman owners place a small 1/8" diameter hole on the aft side of each vent tube just below where they exit the wing skin. In the event that the beveled vent tip ices up, it is possible that the aft side 1/8" hole will remain open and thus allow for tank venting.

**Note:** To determine if the 1/8" vent hole would provide sufficient tank venting to allow the engine to continue to siphon fuel at cruise power settings, we temporarily plugged the beveled vent outlet at the tip and performed limited flight testing. On our short 30 minute flight, we did not observe any problems with the engine running at 75% power on the tank with the plugged tip vent (and only being able to vent through the 1/8" aft hole).

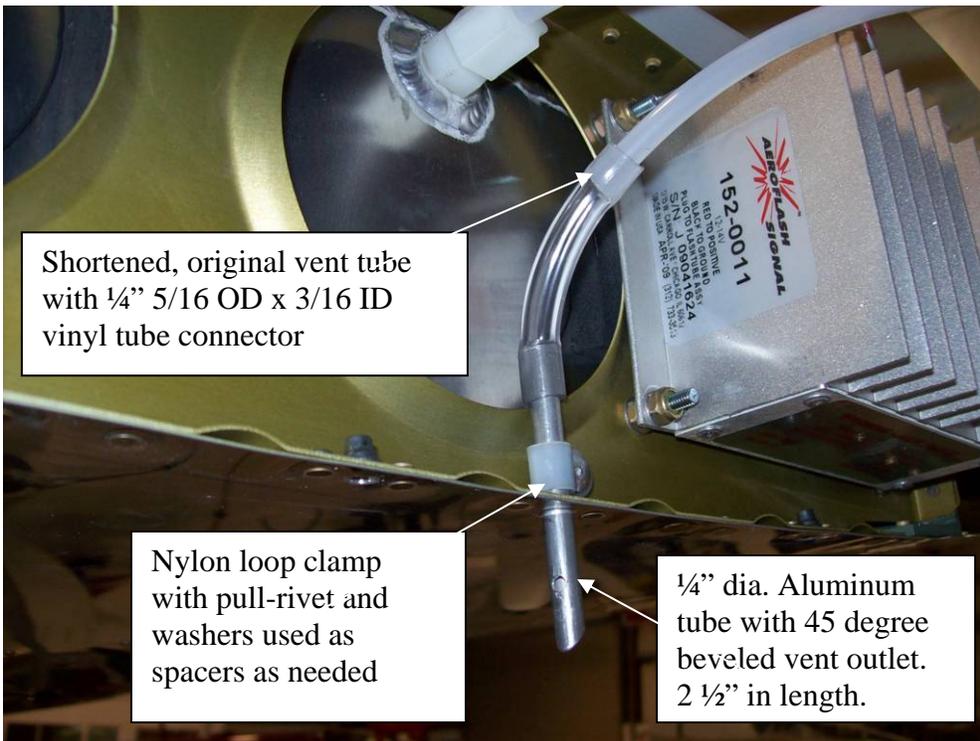
We have found it difficult to drill a neat hole through the plastic vent tube. The best method we've found is to sharpen the back end of a 1/8" diameter drill bit, heat the tip, and push it gently through the tubing wall. (See photo below.) Be sure to leave enough space between the lower wing skin and the small vent hole to allow for sliding a plastic sleeve over the vent line as a means of plugging it in the event the wings are folded with fuel in them. **Do not get any flame or heat source anywhere near the fuel vent outlet because fuel vapor is highly flammable!**



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As an alternative to drilling a hole in the plastic vent tube, we've recently modified our vent tube installations to incorporate a 1/4" diameter aluminum tube for the portion of the vent tubing that mounts to and exits each wingtip. We are using a 1/4" diameter aluminum tube that is 2 1/2" long, with a 45 degree beveled end. As the following photo depicts, we drill a 1/8" hole 1/2" up from the bottom of the aft side of the tube. We feel there are several advantages offered by substituting the aluminum tube:

- 1) The alternate vent hole can be neatly drilled on the aft side of the tube
- 2) The plastic vent tubes tend to bend and move in flight, making it difficult to equalize the vent pressures between the left and right tanks for balanced fuel flow. The aluminum tube is very stable in flight and we've found it easier to achieve balanced fuel flow between tanks with this installation.
- 3) The angle of the vent outlet can easily be filed on the aluminum tubes to adjust the air pressure. Whichever fuel tank drains first has higher vent pressure, so filing a slightly shallower angle on that vent will reduce the air pressure. In this manner, the fuel drain rates for both main tanks can be made more even. They will never be perfect, but can be adjusted to drain evenly to within 2-3 gallons of each other.



Be sure to leave enough space between the lower wing skin and the small vent hole to allow for sliding a plastic sleeve over the vent line as a means of plugging it in the event the wings are folded with fuel in them.

To order a FUEL VENT, ALUMINUM RETROFIT KIT, p/n 933-05000-01 \$9.95, please contact our parts department at [parts@glasairaviation.com](mailto:parts@glasairaviation.com) or 360-435-8533 ext. 1.

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