

SERVICE LETTER 2

SUBJECT: Fuel pressure fluctuations in Glasairs

APPLICATION: All fuel injected engines as installed in all models

DISCUSSION: There have been some reports of fuel pressure fluctuations being observed during flight in fuel injected Glasairs. Based on our experience with company prototypes and additional investigation, we can offer the following observations:

During high fuel flow conditions the pressure fluctuations will be more likely seen with AC type diaphragm pumps than the Romec style vane pumps. By design, the diaphragm pump output pressure will fluctuate as it operates. This is a characteristic that does not affect the Bendix fuel injection system as long as these pressure fluctuations stay within the range stated in the engine operation manual.

These fluctuations will be more observable with a Vision Microsystems (or similar electronic type) gauge. This is due to the very fast nature of the system. It "takes a reading" for a few milliseconds every cycle. It may catch the normal pressure fluctuations of the pump at different times and report a different reading to the gauge. This is a true representation of what is happening in the fuel system but may be information a pilot is not used to seeing. A mechanical gauge, by it's nature will average the pressure pulses and may not show fluctuations. If you prefer to not see these fluctuations, the Vision people sell a "snubber" to place inline between the pressure tap and the transducer in order to dampen the pulses.

Please note that the above situations only affect the readings at the fuel pressure gauge, not the operation of the engine.

If the average of the pressure fluctuations fall below the recommended limits and/or variations in fuel flow readings are observed, more investigation is in order.

Some of the possible causes of significant fuel pressure variations are:

1. **DEFECT IN THE MECHANICAL FUEL PUMP:** AC style pumps can develop pinholes in the diaphragm or leaks in seals and gaskets. There have been service bulletins and at least one AD relating to improper repair or overhaul of these pumps. New manufacture units are usually not affected. It should also be noted that there are different models of diaphragm pumps with various pressure ratings. Be sure the pump used matches the fuel system. Romec type vane pumps can develop leaky seals or fail due to wear or improper repair. Again new or quality overhauled units minimize this.
2. **RESTRICTIONS IN THE FUEL SYSTEM:** These may be caused by kinks or poor bends in fuel lines, use of defective or incorrect fittings(the passage way through a fitting is smaller

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than the line), incorrectly made flex hoses(inner wall damaged during assembly),or contamination from debris in fuel tank. A common restriction found among kit builders has been a small rubber flap that can be created inside the hose, during line fabrication, when installing a reusable fitting without using the proper tubing mandrel. This flap can act like a check valve completely blocking the fluid in one direction. Always inspect your hose assemblies internally after assembly and prior to installation.

3. **RESTRICTIONS IN THE VENTING SYSTEM** with the same causes as above. It is recognized that a number of builders have modified their fuel system in various ways. It is important to assure these changes do not add restriction to fuel delivery or vent systems.

4. **FUEL FLUCTUATIONS DURING HOT WEATHER, HIGH ALTITUDE, HIGH POWER SETTINGS AND COMBINATIONS THEREOF:** These fluctuations can be caused by the onset of vapor lock (boiling of the fuel). The solution here is simple. Use the boost pump during startup, taxiing, takeoff, climb, any high power operation, descent and landing. There is virtually no penalty for using your boost pump in any of these situations, and it can prevent many fuel delivery problems.

For further information on these subjects, you may contact Stoddard-Hamilton builder support.

					
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