

GLASTAR SERVICE LETTER 5

Subject: After Market or self-developed electric flap installations


Applicability: All GlaStar aircraft with Electric Flaps

Discussion: Although New GlaStar, LLC does not offer an electric flap option for the GlaStar, some builders have installed electrically driven flaps on their planes. Since the GlaStar was developed with manual flaps, the installation of a power driven system could conceivably overload the current flap control structure. New Glastar, LLC is not endorsing the installation of electrical flaps and is cautioning builders that a complete evaluation should be done by the builder or other qualified engineer which may require the strengthening of some or all of the flap control system.

Manually driven flaps are inherently safe as the pilot has a direct input into the actuation of the system and can immediately determine if there is an increase in actuation loads due to excessive friction, binding or other failure within the flap controls. Electrically driven systems relieve the pilot of the manual input but also remove any source of system feedback unless some means of limiting or overload switches are installed.

Certified aircraft must address the design and testing of flaps in paragraphs 23.457, 23.697, 23.699 and 23.701 and the last one (Flap Interconnection) can be the most difficult to deal with. The risk of a flap control failure on take-off or landing could potentially place the airplane in a severe asymmetric flight situation at very low speeds.

The Flap Interconnection analysis and testing is addressed in AC 23.701 where it gives guidelines into acceptable testing procedures. Depending on the configuration of flap controls, the loads within the system can vary greatly. For example, each flap imparts a load **F** into the pushrod and the control system. The actuator must be capable of loads from both flaps or **2*F** and is sized accordingly for those values. Now assume one of the flap tracks jam while being retracted while in flight. The actuator applies **2*F** to retract, the free flap applies **F** and the jammed flap tries to restrain the entire system or **3*F**. A pilot operating manual flaps would immediately sense something is wrong and not overload the system. The electric actuator knows only on or off and will readily give full power without warning resulting in potential overloads if not adequately designed.

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