

GLASTAR SERVICE BULLETIN 32

MANDATORY

Subject: O-320 and O-360 exhaust system [P/N 925-02000-01 and 925-03000-01, respectively] cracking

Applicability: Exhaust systems shipped prior to 7/31/97 **and** installed on Dynafocal-mount Lycoming engines

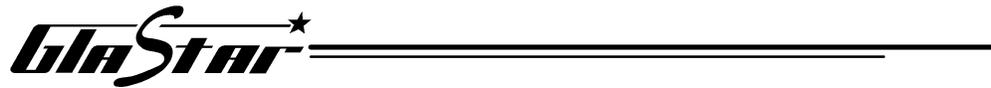
Discussion: Examples of the stainless-steel exhaust systems sold by Stoddard-Hamilton for both the Lycoming O-320 and O-360 engines have exhibited premature cracking where the exhaust stack meets the main collector manifold inside the heat muff. Being subject to extreme heat and vibration, exhaust systems are naturally limited-life items, but these failures have occurred after as little as 15 hours in service, which is clearly unacceptable. (This worst-case failure occurred when the GlaStar prototype was first put on floats, and this flight regime would of course be expected to be harder on all aircraft systems.)

The S-H exhaust systems are patterned closely after the certificated system used on various models of the Citabria and Decathlon aircraft. On consulting our vendor (the same company that makes the certificated exhausts for American Champion Aircraft) about these failures, we learned that all the certificated exhausts are used on conical-mount engines, whereas all the premature failures occurred on Dynafocal-mount engines.

The Dynafocal mount was developed to isolate the airframe from engine vibration. The by-product of this isolation, however, is that the Dynafocal-mount engine itself (as well as anything attached rigidly to it) vibrates all the more vigorously. The vibration of a conical-mount engine is transmitted more directly into the airframe. Since the exhaust system is mounted rigidly to the engine, we hypothesize that the observed cracking has been caused by the extra vibration of the Dynafocal-mount engines.

Naturally, any exhaust system cracks pose serious safety-of-flight concerns, especially if they occur inside the heat muff, leading to the possibility of the direct infiltration of exhaust into the cabin.

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Required Action: As a **mandatory pre-flight item, inspect your exhaust system for cracking before every flight.** Because of the nature and location of the observed cracking, this inspection can be performed simply by grasping the end of the exhaust stack firmly and wiggling it back and forth. There will naturally be a small amount of flex in the system, but any significant movement of the stack or any squeaking noise indicates the presence of cracking. Any evidence of cracking found will render the aircraft unairworthy until suitable repairs are made.

Stoddard-Hamilton is currently working with the exhaust vendor to develop a long-term solution to this problem. Details of this solution will be communicated to you in a **supplement to this service bulletin** as soon as they are finalized. We will endeavor to come to this determination as quickly as possible and to implement the solution in such a way as to minimize downtime and inconvenience to the builder.

Recommended Action: Stoddard-Hamilton **strongly recommends** the installation of a carbon monoxide detector in all GlaStar cabins. Either a sophisticated electronic annunciator or a simple, inexpensive "Dead Spot"-type detector can prove to be a lifesaver in the event of an exhaust leak.

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