

Self-Launching
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Previous articles from the SSF have focused on the skills needed to safely launch by Aero Tow. In this article, I would like to turn to the skills needed for safe Self-Launching.

A detailed explanation of the required certification and pilot Endorsements for what the FAA calls "powered gliders" (and we often refer to as motorgliders) can be found in FAR 61.31 and AC 61-94. It will be impossible to cover in detail all the information I normally share with my Self-Launch trainees, so let me highlight a few key areas. Those with greater interest may feel free to contact me for personal training.

First of all, since powered gliders have more systems to operate than their "pure" cousins, checklist familiarity and use is paramount. The biggest change from unpowered gliders is managing the engine. Just like we operate in large, multi-crew aircraft, creating and using "cockpit flows" of action items backed up by a checklist is recommended. The more familiar the action items are, the easier it is to create a working flow that is logical and efficient. The more modern the Self-Launcher, the more automated powerplant systems have become, but all require certain important steps to be done in the correct order to either start, stop, extend, or stow the engine. Unfortunately, it often only takes 1 item performed incorrectly to prevent success.

Let's start with ground operations, and proceed through a typical flight using Self-Launch, and the first decision is where to start the engine. Most Self-Launch sailplanes are equipped with steerable tailwheels and wing tip wheels that allow for powered taxi. Consequently, it makes sense to start at the hangar and taxi to the runway like an airplane. When doing so, be sure to plan on how to avoid airport signs and taxiway edge lights. For those that cannot or choose not to taxi, perform standard staging to the takeoff grid, being sure not to block access to the runway for other users, especially if operating on a public, common use airport. Given the latter, I strongly encourage powered taxi to fit in with the normal flow of departure traffic. If required by contest conditions to stage with non-powered gliders, the best option is to line up separately, and takeoff under power at the appropriate time. If a separate line up is not an option, then use extra caution when it comes time to start the engine in order to launch in sequence, allowing enough time in advance for engine warm-up.

After completing the Before Start Checklist, be sure that the area around the prop is clear before starting. Since many Self-Launchers' prop is behind the cockpit, this can be tough to do-I actually had an ill-informed spectator come up from behind to watch, and was unknowingly dangerously close. The time honored signal for an airplane about to start engines is to turn on the rotating beacon, but since few gliders are so equipped, a healthy shout of "Clear Prop" from the cockpit is a good substitute.

Depending on the type of glider, engine start can seemingly require three hands-somehow, brakes must be applied, flight controls secured, and starter engaged all at the

same time! Clever use of hands and knees usually solves this problem. After start, idle the engine while taxiing, but try to avoid excessive idle operation, since most 2-stroke engines tend to foul their plugs at low RPM, which will seriously degrade takeoff power. Holding short of the active runway is a good place to accomplish the Before Takeoff Checklist. When ready, proceed on to the runway and commence the takeoff, paying special attention to engine indications. All engines have known parameters that indicate when they are producing full power, usually measured by RPM. If the engine is not performing, abort the takeoff and clear the active runway. Do NOT continue a takeoff when less than normal takeoff power is being produced. During the takeoff run, a go/no-go point must be considered. Part of every pilot's required preflight duties is to review the weather conditions and calculate the takeoff distance, which will lead to an understanding of where on the runway the takeoff should take place. If it's not happening according to plan, abort the takeoff and clear the active runway to investigate.

From start up through taxi and takeoff, the prudent Self-Launch pilot will always be ready for engine failure. Should it occur soon after takeoff, analogous to a low altitude tow rope break, timely action is required. Herein lays the biggest difference during launch compared to aero tow. During Self-Launch, climb speed is normally quite close to the approach airspeed, as opposed to 10 or 20 knots above it as during aero tow. Should the engine quit, the total drag picture is quite different-the high drag of the engine and propeller extended combined with a relatively low airspeed means that pitch inputs to lower the nose and preserve airspeed are crucial, with maneuvering as allowed by altitude to put the glider on the ground safely, straight ahead if need be.

After takeoff, I recommend a close in rectangular pattern be flown while making the initial climb, so that if the engine quits, I can easily glide to the runway. A straight out departure to the nearest good looking cloud might be more expedient, but prudence suggests conservatism.

Having reached a sufficient altitude, stopping and stowing the engine is next. Again, perform the cockpit flow for shut down, and follow up with the checklist. My caution here is to never stop and stow, or extend and start an engine unless you are over terrain you can land on. This doesn't have to be an airport, but certainly, a safe spot for landing should you be unable to successfully stow the engine.

After having spent a long day of soaring, be sure to monitor your powerplant systems before attempting an in-flight start. One of the great uses of an onboard engine is to complete that last 30 or more miles home when the lift quits before you had hoped, but be sure to check battery, fuel, and cold-soaked status before starting, and again, don't do it unless you are over a spot you can safely land on if it doesn't go well. My personal rule of thumb is to never attempt an in-flight start below about 1200 feet agl, with suitable landing spots picked out long before that. If the in-flight start attempt is not successful, wisdom dictates that the engine is secured and ignored while a normal (for you) pattern and landing is made. Repeated unsuccessful start attempts at low altitude have been the cause of numerous landing mishaps that could have been avoided if attention were focused where it should be-flying the glider to a safe landing!

By this time you should conclude that, especially for the glider pilot without airplane piloting experience, there are a lot of things to consider beyond hooking up the tow rope and following the tow plane to Self-Launch. Ground and Flight training with an experienced CFI-G is the key toward making your Self-Launches safe and successful.

Consistent use and maintenance of your Self-Launcher's engine will go a long way toward keeping it reliable, but even more important is keeping good discipline in the cockpit. Powered gliders are a little more complex than unpowered ones, but offer a lot in the way of flexibility and freedom. Since first becoming enamored of the concept 16 years ago, I just completed over 40,000 km of incident-free cross country soaring, fulfilling the requirement of the World Distance Award. I hope you will find it equally enjoyable.