



## What happened to my 50:1 glider?

By Eric Greenwell

It's not a surprise to a self-launching sailplane pilot that his sailplane doesn't sail nearly as well when the propeller (*and* engine on a lot of them) is extended. What is a surprise to many is how much performance they lose, because they've never tried it, or it's been so long since they tried it, they forgot what it was like.

There are two common situations where a propeller might fail to retract:

- After a successful launch or in-flight restart and climb to altitude
- After a failed in-flight restart

We join our pilot just after he's shut down the engine...

### **The propeller didn't retract...Oops!**

Ok, motorglider pilot, now what? Implementing Plan B, perhaps? What, no Plan B! Yikes!

It's "Yikes" because our surprised pilot is not piloting the 40 or 50 glider he paid so much for, but instead has a 15 or 20:1 glider because the propeller and mast are sticking up in the air. So, instead of being within easy reach of lift or an airport, he finds himself thinking a humble 1-26 would be a big plus at this point. We can talk about what he should have done later, but ...

### **What does he do now?**

Fly the glider! And not just keeping it right side up, but picking a place to land if you don't get things sorted out. Then ...

Try it again: Go through the retraction procedure methodically. A checklist can be a big help here, forcing the pilot to slow down a bit and making him check things that he might forget because they don't normally go wrong, such as an open breaker or the propeller not quite vertical. And if this doesn't work...

Continue to fly the glider, and check that landing place! Then ...

Start the motor: with it running, he can get to a safe landing area or even an airport, where he can land and sort things out safely. But what if the motor doesn't start? Still some time?

Try it again: go through the restart checklist as carefully and calmly as you/he can - pretty much a repeat of the failed retraction advice. And it still doesn't work...

You have to land on that field you selected, or hope you can find a thermal that will get you high enough to get to a better field, or give you time to come up with a better idea. With about 3 times your normal sink rate, it will have to be good thermal.

### Avoiding all the excitement

What he should've done is probably obvious by now: stay closer to the airport/field until the propeller is retracted! Or putting it another way, keep a steep glide angle back to the airport/field; say, 15:1 or less, depending on the particular glider, plus enough for a safe pattern in this high drag mode. With a good-climbing motorglider, say 5 knots up at 50 knots airspeed, you can climb straight out and achieve this glide slope; however, with a slower climb at higher altitudes or with a tail wind, you might need to circle a few times.

### And the other situation...

The second situation where a pilot might be left with the propeller extended is after a failed in-flight restart. This is potentially more serious than the first situation, because it typically occurs close to pattern altitude, so the pilot doesn't have much time to sort things out. He must be prepared for a failed start, and perhaps landing with the propeller mast extended. Briefly, here's what I do:

At no lower than 1000' AGL, I enter a long downwind (point A) for my selected field, and configure for a landing (extend gear, set flaps, all landing checks). Now I am positioned to complete a safe landing if the motor doesn't start, even if I don't (or can't) retract the propeller.

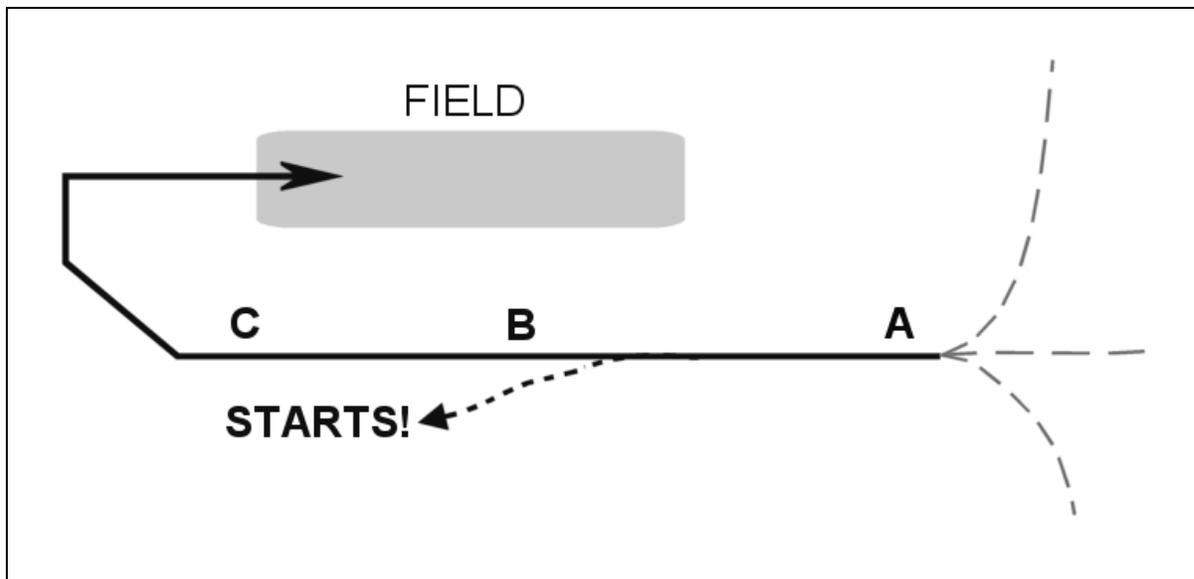


Figure 1

On downwind, I extract the propeller and attempt to start the engine. If it doesn't start after a couple of attempts, I might retract the propeller at point B if there is enough time and altitude. At point C I abandon any attempts to start or retract the propeller, and then I focus entirely on completing the landing while I still have the altitude to do so safely.

Because landing is a critical event, it's important that the pilot is able to handle the additional workload of starting an engine, AND the degraded performance caused by an engine if it fails to start. I practice propeller-out patterns at the home airport, so I know I can do this safely if I start at least 1000' AGL. I suggest every pilot try this so he knows how high he should be when he prepares for a restart, and isn't surprised by a much poorer glide than he expected. It's not just for that rare time when the propeller mast won't retract, but when things go poorly and you can't afford the time and distraction of retracting the mast.

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For a more detailed discussion of this situation, and the many other aspects of operating motorgliders safely, effectively, and enjoyably, please consult my "Guide to Self-launching Sailplane Operation". It's available as a free download from the Auxiliary-Powered Sailplane Association's website at [www.motorglider.org](http://www.motorglider.org) (click on the "Publications" link in the menu).

