CONVERTING TO SELF SUSTAINING GLIDERS – GUIDANCE MATERIAL

Self sustaining and self launching gliders are increasing in numbers throughout Europe. Because of design limitations and certification requirements, the majority of self sustaining gliders have retractable engines mounted on a pylon and are dive started.

BRIEFING NOTES

Any pilot who intends to fly a self sustaining glider should of course read and absorb the flight manual. It makes sense for that pilot to understand how the power plant systems and switch logic work and to be able to recall the engine/prop extension and starting procedure from memory. An insight into the manufacturers recommended fuel mix ratios and pre start engine priming will be extremely valuable. Fin mounted pitot and static sensors may be affected by propeller wash.

Conversion

As the conversion provides two challenges, namely operating a new type and operating a dive start power plant for the first time, it is recommended that pilots learn to fly and operate the glider before attempting a power plant extension and use. It may be appropriate to provide training in a self launching sailplane or even some types of touring motor glider. In all cases, pilots should read and absorb the information provided by the manufacturer.

The priority emphasis in all cases when attempting to operate the power plant systems should be to FLY THE GLIDER.

At some point pilots should explore the slow speed and pre stall/stall symptoms with the power plant/prop extended. In some cases the airflow break masks pre-stall buffet – critical to note when starts can take place in high pressure scenarios.

Prior to first flight, a ‘power plant stuck out but not running’ situation should be thought through. In most cases, the additional drag is similar to about 1/2 airbrake so the circuit should be flown accordingly. Pilot should first read the manufacturers notes and then practice this scenario.

Pilots operating the power plant should always consider attempting a start in a position where they can fall back into a sensible high key position for a circuit to land in the event of starting problems. This is particularly important when operating the power plant following a winch launch. The manufacturers operating notes may provide advice regarding power plant starting heights, but if not it can be assumed that start attempts below 1000 feet above the potential landing point should be treated with extreme care.

During conversion flights pilots should become aware, of time required for engine to develop power and the eventual climb rates that can be achieved. In sinking air masses / rain it may not be possible to climb at all. Operation in rain will in many cases ruin the propeller.

Emergencies

Glider pilots converting to self sustaining gliders are likely to have little training in dealing with power plant and fuel system related emergencies. The following emergencies should be considered. In all cases, the manufacturers suggested response to emergency situations should take precedence.

Fire in the Air

Fly the glider
Fuel Off and Ignition Off
Do not retract the pylon
Land as soon as possible
Consider bail out

Engine Stop/Failure

Fly the glider
Select landing field
Check fuel selected on, check pump on and contents sufficient
Restart if height allows

If the failure is obviously mechanical, do not attempt to start
Fuel Off and Ignition Off
Land as soon as possible

Self Sustained Flight

Prolonged, powered 'cruising' can lead to significantly accelerated engine wear in some self sustaining power plants – the manufacturers operating notes will offer guidance and may refer to a climb and glide saw tooth profile. Engine noise can make the radio unusable and therefore flight near of within controlled airspace presents difficulties.

Using the power plant to avoid an out landing requires pilots to develop an operating philosophy that reduces the risk associated with either a pilot or mechanically induced failure to start. A recommended priority order when the decision has been made to use the power plant to avoid a field landing is;

- Select a field in the normal manner
- Note the minimum engine start height and position the glider appropriately to cope with a no-start situation
- Extend and start the power plant
- Fly defensively – the power plant may take time to run smoothly and produce full power

Environmental and Legal Consideration

Self sustaining sailplane power plants can produce an unpleasant noise and because of the low airspeed at best climbing angle or best rate of climb, the noise can appear to remain over a particular ground position for a prolonged period of time. Pilots should consider their location when flying under power, and thereby give due consideration to

people and wildlife. Over-flight of built up areas and public places should be avoided where possible. It should also be noted that Rule 5 of the ANO applies to self sustaining sailplanes, although dispensation is provided for ridge soaring.

Airmanship

As outlined above much can be done to ensure safe operation of the aircraft through familiarity with its systems and characteristics. However, sooner or later the engine will fail to start, either for a technical, or more likely, handling reason. If, as suggested this is at least 1,000 ft agl., then there should be time to attempt to sort out the engine or if that cannot be achieved, land safely.

It is apparent that Turbo pilots, keen to operate for as long as possible as a sailplane, can be tempted to operate below 1,000 ft agl. Also, the more often the engine has been successfully employed the harder it is to believe that it may fail and that a field will be required. The result can be as follows:

> *Gliding out below 1,000 ft., hoping to get away, the pilot, aware that things can go wrong, flies towards possible fields and makes a selection. The engine is deployed, but fails to start! Disbelief prompts another immediate unsuccessful attempt to start. Now, having wasted valuable height trying to start again, the pilot realises that the field he picked, when he didn't really expect to need it, is not as good as he thought. Further he is low and ill positioned for a circuit he did not expect to make. Now, shocked and perplexed by the failure to start, he is faced with tremendous pressure flying a circuit into a poor field, probably having not landed out for quite some time.*

The second attempt to start is understandable but if the failure is technical, it is unlikely to have fixed itself and if finger trouble, the pilot, now under pressure, will almost certainly repeat the mistake.

Much can be gained from flying Turbo's, but the demands on airmanship and self discipline cannot be overstated.

Footnote

The increased risk of pilot error due to the added complexity of power plant systems is managed effectively through knowledge, self discipline and practice. It must be emphasised that the availability of a self sustaining power plant does not eliminate the need for periodic field selection and field landing practice.

BGA Instructors Committee
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