

## SAFETY FOR STARTERS

The club places a great deal of emphasis on safe flying for the benefit of members, the public, and the good name of model flying in general. This theme is followed through in our instruction scheme, and should be in our minds every time we operate a model.

One aspect of safety which perhaps has received less attention than airborne considerations surrounds the operation of model aero engines on the ground, particularly starting routines. When the BMFA Area Chief Examiner visited our field recently to test (successfully!) two members for their Examiner/Instructor awards, he voiced a general comment that there appeared to be a number of inherently unsafe practices used by various club members in their engine starting technique. Against this comment, I have compiled the following list of recommendations which you may find useful, particularly if you are new to the game, or are about to move to the use of a larger engine.

Please be assured that I am not trying to be 'holier than thou' in this article, indeed I have been guilty of many of the bad habits listed.

The recommendations are not exhaustive, and additional comment will be welcome.

### Siting the Model

- site your model in the designated model park area, which will be a safe distance from the circle/flight line; if in doubt, seek advice;
- position your model courteously, i.e. so that you will not blow your exhaust over the operator or model behind you/upwind of you;
- remember for large (5kg+) models, you must be 60 metres away from all other persons not definable as 'operators at the same event', i.e. casual visitors from the Ridgeway: ask them to move back the required distance before you start up. If you don't, and a non-operator gets hurt from a piece of broken prop, your insurance cover may be invalid;
- before you start-up, ensure that other operators or members of the public are not in line with your propeller arc, again - ask them to move behind the line of the prop., explaining politely that this is for their own safety;
- never attempt to start an engine sited over loose ground, gravel, etc; or in grass long enough to foul the prop.

### Model Restraint

- whenever possible, get a fellow operator to restrain the model while you start-up; this is advisable for all models, but ESSENTIAL for large models.
- your assistant should take a firm hold of the model, one hand at the back of the fuselage in front of the tailplane, the other hand around the leading edge of the wing;
- he will prevent the model from being pushed backwards by an electric starter if used and, of course, prevent forward movement of the aircraft when the engine fires;
- the use of an assistant will avoid dangerous one-(often oily)handed start-ups;
- 'fixed' restraints may be used quite safely, but care must be taken in use; a fixed restraint may take the form of pegs or a hoop driven into the ground, in front of the tailplane or, much less satisfactorily, a heavy field box or the like placed in front of the wing. If the peg or hoop restraint is used you must be very sure that the tailplane construction and mounting will take the load your restraint will place upon it. Such restraint will not prevent the model from being pushed backwards by a starter, and so may allow the aircraft to jump forward against its restraint when the engine fires.

Also a tail restraint may not prevent the model from being tipped-up by a side-wind lifting a wing with potentially dangerous consequences.

Use of a field box or similar weight to hold the model back is also a potentially dangerous practice. Again, the restraint will not prevent backward movement of the model (a jump-forward of a model pushed 2" back by a starter in such circumstances caused a very serious hand injury at a recent LMA event); also such restraint is lop-sided (i.e. in front of one wing panel) and so may allow the aircraft to swing around under power.

In my view, there is no substitute for a capable assistant to restrain a model when starting; (advocates of 'fixed' restraints will contest this view);

if you see someone attempting to start a model single-handed, offer to help he may be too shy to ask you, but he is sure to appreciate the assistance you can give.

### Propellers

- never use a metal propeller;
- make sure that the propeller you plan to use is of a size and material suitable for the size of engine and use you will put it to; if in any doubt seek advice from a more experienced member;
- the safest props are made from wood, or glass filled nylon; seek advice if you plan to use a prop made of any other material;
- never use a damaged or cracked propeller; if it is going to break, it is likely to do so under starting load, i.e. near you and other people;
- check the condition of your propeller before each run; even a seemingly innocent bump on landing may have rendered the prop unsafe for subsequent use;
- never cut or drill the prop to accommodate a spinner or other fixing;
- always use a spinner;
- paint the tips of your prop white (about 1") to make the extremities of the arc more visible;
- always balance your prop. before use; seek advice if you need it;
- if you buy a propeller second-hand, e.g. with a motor, inspect it very carefully before use ~ the previous owner may not have been as careful as you;
- remember that the swept area of a propeller increases dramatically with the diameter of the prop.; when you move to a larger engine and prop, YOU MUST re-educate yourself to the increased prop. arc - practice giving yourself an artificially wide berth to a large prop, such exaggerated movement educates both you and others - I have seen this technique used very effectively on the field - watch for it, and copy it! NB. the tip speed of a 20" prop. turning at 8,500 rpm is 505 mph - quite a scythe.
- ensure that your engine is firmly mounted - bolts do work loose;
- respect the power of your engine - they all bite, even the small ones!

### Operator Positioning

- always use a chicken finger or a heavy glove when turning over your engine;
- NEVER kneel in front of an engine running at full-bore; crankshafts do break, prop nuts do come undone (a particular risk with 4-strokes) - we have had a serious leg injury in the club; just think what could get cut off! Kneel to the side of the thrustline; with the model suitably held by an assistant, this will not cramp your style;
- the attachment of glow clips, and the adjustment of needle valves, require that you work closely to the prop with the engine running; the risk of injury can be minimised as follows:
- do not reach over the prop to make adjustments; work from BEHIND the prop: if you inadvertently touch the prop from behind ' it will tend to push your finger out of the way; touch the prop from the front, and your finger will be pulled into the blade;
- on larger, multi-cylinder, engines it is advisable to hard-wire the glow plugs back to a jack-plug located in the cabin area, ie well away from the prop line (see my Aeronca for an example of this);
- disconnect the glow-power when you are adjusting a stopped engine;

#### And Finally

- do not let your engine idle with the model unrestrained in the pits;
- kill your engine before you turn off your radio;
- remember the duty of care you owe yourself, your fellow members, and the the visiting/passing public - if you doubt the safety of your equipment, ground it;