

HOW TO START YOUR ENGINE

If you haven't much experience around model aero engines starting can be a daunting experience. When a standard .40 engine is running you have a 25 cm propeller whirling around at 12,000 rpm (200 times a second) which is potentially quite dangerous. If you are new to the hobby and your first plane is ready for the air I recommend getting an experienced person to start the engine initially. Assuming the engine has been set up for you try this procedure to avoid a few of the nasty surprises that are lurking to catch you out.

If you are right handed set up the equipment as per the photograph on the next page. Hold the model with your left hand and operate the electric starter with your right one. Once the engine is running this allows you to operate the throttle, remove the glo plug lead or pocket starter and you still have hold of the aeroplane. If something should go wrong and the engine starts at full throttle at least the plane is restrained while you can use your free hand to deal with the problem. Whilst on the subject of restraints I believe some clubs have made their use mandatory although I think the safest system is to have someone hold the plane for you. Although a restraint will stop the plane moving forward the model also has to be stopped from moving backwards when you push the starter on to the spinner. Personally I am not a fan of any system that uses the tailplane as a restraint and as an alternative I have used is a screwdriver in front of each main wheel. I have used this system many times when starting a 1/3 rd scale Sukhoi powered by a 74cc Zenoah twin all by myself.

If someone is holding the plane I recommend holding they grab leading edge of the left wing and the fuselage just in front of the fin. This allows good control as the starter is pushed on and off. If a problem develops this person is also in the best position to stop the engine. If the radio is switched off or the throttle has jammed the easiest way is to screw the needle valve in until the engine stops which should happen in a few seconds. You can also



Prevent your fingers and even your plane flying away by starting the engine at a safe low throttle setting.



Line the starter up and push hard. When the engine is primed just connect the glo clip to crank it up safely for a perfect score. Fingers one prop zero

pinch the fuel line if you feel confident you can get to it safely. Holding the fin or tailplane is not a good idea because these important but delicate items can be easily cracked or broken if the engine floods and hydraulics or if the starter jumps off. A cracked tail or fin is much worse than a broken one as you may only find out it has cracked once airborne. If you are flying along and the fin falls over a flat spin is the usual outcome. One day a magpie scored a direct hit and I lost the tailplane. The flight path was best described as a vertical descent with the model impacting the ground 45 degrees to inverted. Either way the end result of losing either of these important components was a crash or as some one once described it "No I didn't crash; the fuselage and wings were unable to withstand the load I place upon them." Standing with on foot either side of the model is a no-no in my book. This method offers minimal rearward restraint and people occasionally get their foot caught on the antenna then trip and stand on the tailplane. I have seen this happen quite a few times and I have also seen a helper trip and fall on someone else's aeroplane. This can be extremely embarrassing. I did see a fuselage unable to withstand the load place upon it as a result of a cracked tailplane glue joint. The plane was restrained using the no-no system and everyone was pretty sure this was the cause as not long after take off, the tail fell off.

When you have decided who is going to hold the plane and you have shown them how to do that the first thing to do is turn on the radio system. Perform a control check and once

satisfied everything is working then prime the engine. Priming the engine is usually only required for the first start of the day. If the motor has never been run or it has not been used for a while you need to get some fuel into the cylinder. The easiest way is to open the throttle to full and spin the engine over with the starter. Watch the fuel line and you should see fuel slowly move towards the needle valve after a few seconds. Make a note of the colour of the tubing and as fuel enters the tube it should get darker. It is quite easy to see once you know what to look for. Once the fuel passes the needle valve and enters the cylinder you should hear the engine speed up a little. That is your cue to release the starter. Close the throttle and then move the throttle stick up one or two notches. Connect the glo-plug and crank the starter. When you hear the engine fire wait a second or two, release the



A safe and easy restraining system with one for each wheel.



Keep your eyes out of line with the prop. Transmitter is within easy reach when you put the starter down. Aim the model away from other planes and people.

starter and if the engine is ready it should now be ticking over at a fast idle. If the engine will not start, one of the three ingredients required air, fuel and spark (glo) is missing. Check the carburettor is open slightly eliminates lack of air. Remove the glo plug and check it does actually glo. If not either replace the plug or try another power source. If you are not sure about the plug just replace it to eliminate one possibility. You can stuff around all day and a lousy six dollar glo plug was at fault.

That leaves fuel which will either be too little or too much. If the engine is flooded (too much) the motor will usually fire and stop. You should be able to see fuel coming out the exhaust as it spins over on the starter. Sometimes after repeated starting the prop can work loose and a flooded engine can spit the prop off so it pays to check if its tight. Most beginners I have met are usually unsure how much tension to put on the nut. If you are using the standard issue 4 way wrench tighten the nut

as hard as you can. If you are using a ring or open end spanner get some one to show you.

Once the engine is running and you are satisfied it is not going to stop you can then move around behind the prop to tune the needle valve. Don't forget to turn the transmitter around so you can operate it correctly. Run the power up to full wait a few seconds cut back to just above the idle (two clicks) and then remove the glo-plug clip. Engine tuning with the heat on the plug will usually give an incorrect setting. Most engine have instructions for tuning so be familiar with what is suggested by the people who made the engine. Don't fall for the old trap of tuning up the last few rpm for maximum power as this is a skill that you can develop with experience. Always err on the side of a slightly rich setting. When happy with the full power setting check the engine will idle for 30 seconds and then open the throttle two notches for a fast idle. Most engines can load up and stop with a full tank of fuel if you let them tick over slowly for too long. This is why I use a fast idle.

Now that you are ready to head for the strip a couple of safety tips. When picking up the transmitter hold your thumb over the throttle stick to prevent accidentally knocking it to a higher position as you move the plane. I always start at low throttle for three reasons. The first is if you put your hand into the prop it doesn't hurt as much, although it still hurts. The second

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Always adjust the mixture from behind the model. Never reach around the prop from the front.



The rear needle valve was major safety innovation introduced by OS engines. Tuning on the left hand side keeps you away from the oily exhaust.

is so you don't blow dust all over the models and people behind you. The third is to avoid the possibility of taking off with the radio switched off and if you think there is no way this could happen to you read on. At a national pylon championships in Geelong we all watched a small model take off and then loop and roll all by itself eventually crashing through the top window at the G.P.O. 8 km away. Another pylon racer also at a Nationals many years later and this one took off and looped all around the field totally out of control. Naturally everyone was relieved when

it hit the deck in spectacular fashion at the bottom of a giant loop at well over 300kph. Pilots need to be fairly experienced to fly in a competition of this type and since then I have always wondered how this could happen to someone at that level. I have flown at some pretty big public events and competitions over the years and sometimes when the pressure is on to get airborne after a false start mistakes can be made. The pylon racers in those two incidents were not equipped with a throttle and this removed one chance of noticing there is no control when the throttle was advanced. Performing a radio check before you start is one sure way to eliminate the possibility of an uncontrolled flight. The engine at idle is another back up measure when the radio is off



Not the best method of holding the plane as it is easy break your tail feathers.

at least the plane won't fly away if it is released. In the heat of the moment and I have managed to start the engine with the radio in the off position. The engine would not accelerate as I opened the throttle which alerted me instantly. I have managed to get airborne with the ailerons not connected and I have managed to take off with them reversed but to date I am yet to send up and a radio controlled aeroplane up as a free flight model.

I have used this procedure for a long time now and I still have all of my fingers and thumbs so taking your time to do a control check and moving slowly around the prop will help you do the same

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