



ARTWORK: DON SHULTZ

Get your engine running right with your own fuel, and you'll be surprised at how many groveling, obsequious friends will stop by to borrow a cup or three of fuel. Just be well stocked.

Care and Feeding of the C/L Stunt Engine

By Randy Smith

Castor? Synthetic? Percentage? The perfect C/L Stunt brew got you puzzled? Here's the scoop.

It's nice when your engine purrs like a happy kitten, and goes through the pattern smoothly, coming on and off, exactly when and where you want it. Unfortunately, a lot of times they growl and belch and are a total pain to deal with. One of the biggest causes of this that I have seen is improper fuel. Fuel is one of the most critical aspects in running model motors. Use the right fuel and you will probably notice nothing; the wrong fuel will have you grumbling, or, worse, will have your motor screaming, belching, and running with absolutely no consistency whatsoever.

Most fuels on the market today use a synthetic base and are blended for the R/C sport flier. These are typically very low on oil content, usually in the 12% through 15% range. This is *never* acceptable for our use in C/L Stunt. There are many reasons but the most important is the fact that we do not run our engines in a peaked two cycle, but rather a broad range of four cycle and rich two cycling. Any time you run with the motor set to come on and off in the maneuvers, like a typical ? break) you are not only asking the fuel to lubricate the motor, it also has to cool the engine. The only way you can run in a 4-2 is to heat and cool the parts in the combustion chamber very rapidly. This makes the oil content critical, because it's the unburned oil that has to carry out the heat.

Years ago, most fuels had only one oil, castor. This is still a very good oil with many good but some bad points. Some of its good points: it carries heat out of the motor, and gives a good plating action on all surfaces, especially when they're hot. A few of its bad points: it burns and sticks to the piston sides and the ring groove, and all other parts that are hot enough, and will carbonize the chamber. This cause excess friction and heat, and will ruin your motor in time.

The alternative to castor is a synthetic oil, and almost all fuels have these in them; the vast majority have all synthetic. Virtually all fuel manufactures use one type of synthetic; these are polyalkylene glycols. They are mostly made up of alcohol started linear polymers of oxypropylene groups. These are made by several companies and are available in a large range of molecular weights and viscosities.

This group of oils are the modern version of the old Ucon oils, and also have good and bad points. Some of the good points: they are very good lubes without containing any wax, they have outstanding load carrying capacity, film strength, anti-wear properties, are resistant to sludge formation, and will help keep your engine clean. The bad points are they give no rust protection by themselves, they don't plate hot surfaces as well as castor, and they burn at high heats.

As you can see, both oils have advantages, and disadvantages to them; it's for these reasons that they work much better blended together than they could ever work alone. All my years of flying and research have proven this to me beyond any doubt; plus, you can see this for yourself. Recently, a friend of mine had a motor that would go into the pattern and lean out and act very inconsistently. The only change that was made was to substitute one tank of my fuel in the model. The results were drastically different; the motor now ran very smoothly, going into a two cycle instantly when the nose was raised, and back into a four cycle instantly when the plane was leveled. This was tried back and forth both fuels, his and mine. The results were always the same.

I would like to tell you there is one Stunt fuel formula to run in all motors, but this is not the case, and will never be as long as we have such a wide range of motors, and running styles. What I will tell you is a good formula for the most common types of engines. Make sure you pick a fuel supplier who will give you consistent fuel day to day, and will blend fuel for your motor needs or has fuel to match your needs. *Stay away* from any supplier who will not tell you the oil percentage, or who says one type works for all motors.

For motors like Fox .35s, O.S. Max .35s, or the old McCoy's and K&B's, use a fuel with 28% oil content, preferably half castor and half synthetic. Do not use the synthetic in an old motor that has a lot of time on it with all castor fuel; the synthetic will remove the castor gum off the piston and sleeve and will in some cases leave you with the worn-out motor that you had to start with.

For motors with larger bushings and bushed rods like the O.S. FP, and Magnum GP series, a 23-25% half and half oil mixture works the best. For S.T. .46 through .60s, and most all ball bearing Stunt motors, a 23% half blend works best. The tuned pipe motors like a little more synthetic, and I recommend a 15% synthetic, 77% castor blend. This works very well in the OPS, and Max VF engines, along with the new Super Tigre .51 engines.

You should also make sure you have the motor properly broken in. This will range from six tanks of fuel for one engine to almost two gallons for others. O.S., for example, says two hours running time for their motors. Use the same fuel as you will for your Stunt run, and try to do your break-in on a bench, this is a lot better and an easier way to do a proper break-in. A diameter, one inch smaller than you plan to run at a 3 or 4 pitch should be the prop to use. This lets the motor turn many revolutions more per motor run time. Start out in a very sloppy four-cycle for cast iron piston and ringed motors, slowly progressing to the fastest it will run in a four-cycle, then put it in a short two-cycle burst for short times. After the correct amount of time it should be able to run in a two cycle without heating up and going leaner.

For ABC, AAC, and ABN motors, start out in a very fast four-cycle and about every 45 seconds pinch the fuel tube to kick the motor into a momentary two-cycle. If you can run the motor in a fast four-cycle, and without touching the needle, pinch the tubing to lean the motor into a two-cycle for 20 seconds or so, then it should go right back to a four; if not, it probably needs more running time. When you first crank the plane, notice if it goes rich and sags slightly when the battery