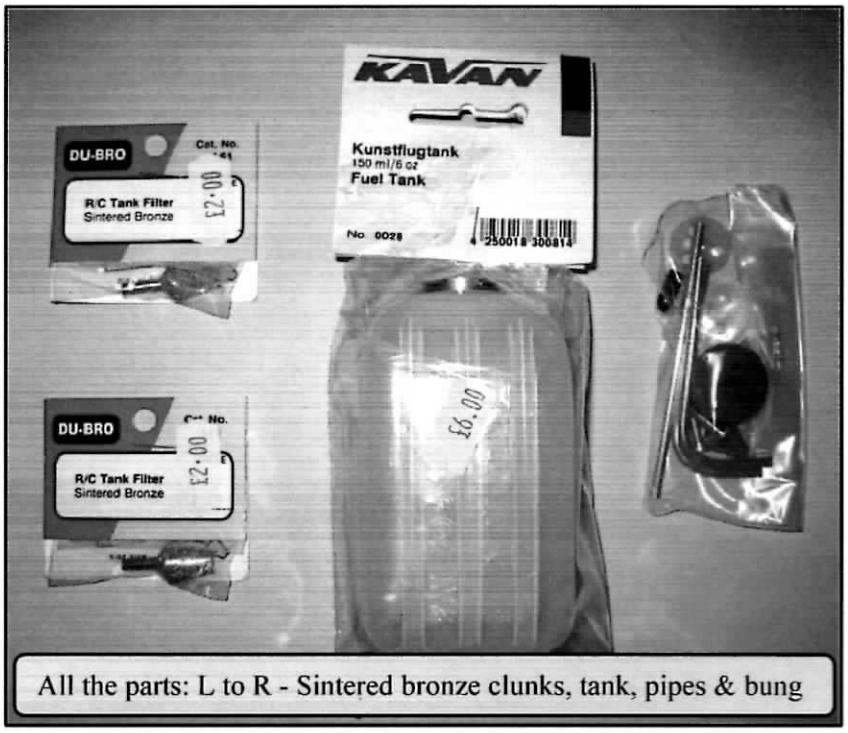
A PLASTIC CLUNK TANK FOR ALL REASONS (but particularly control line)

John Benzing puts together a plastic clunk tank that will work in any control line stunt model.



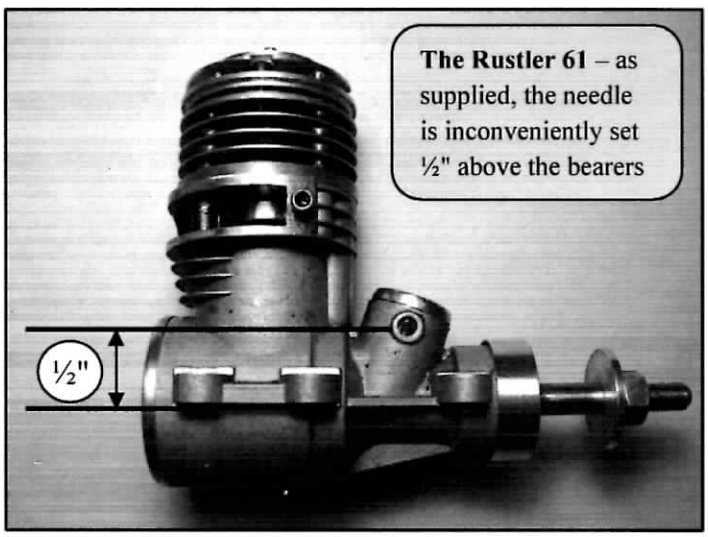
All the parts: L to R - Sintered bronze clunks, tank, pipes & bung

Opinions regarding plastic clunk tanks seem to fall into two distinct camps – you either love them or you hate them – and I'll be frank, I love them. At the Milton Keynes club we spent ages getting them to work properly in the critical control line mode, but finally, after several years of fiddling, we got it right.

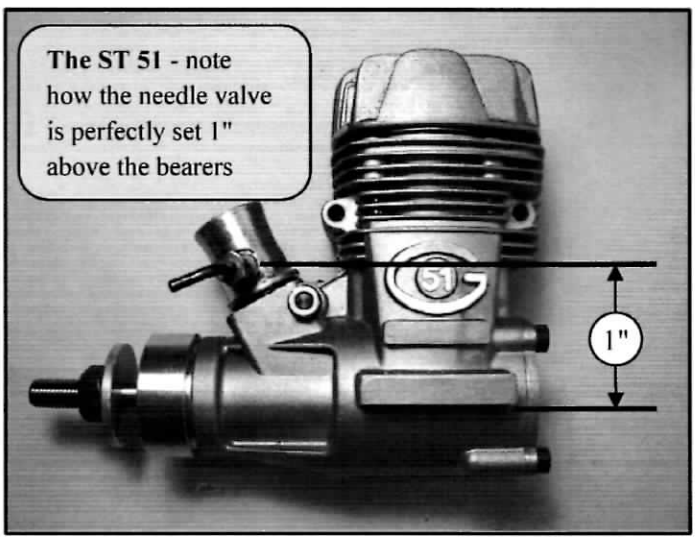
So the assembly procedure I'm going to explain in this little article really does work. Better still, the tank will work using either a two-stroke or four-stroke engine and it can be positioned in either a side mounted or upright configuration. In addition, you will also have the option of plain engine suction or exhaust pressure feed. You really are going to be in a win win situation with this tank!

But first of all, which type of tank should we be using? The one that comes out on top for me is the 150cc Kavan which measures 2" x 2" x 3½" and which is the ideal size for most stunters. As regards positioning the tank in or on the side of model, a good starting point for all types of tanks is that the centre line of the needle valve should always be level with the centre line of the tank. Fine tuning adjustments to achieve an equal engine run in both level and inverted flight can be made at a later date on the flying field (more on this later). Those of you still paying attention will have realised that a 2" square tank means that if the needle valve on the engine is to be level with the centre of the tank it needs to be 1" up from the bearers in a traditional stunter (or down if an inverted engine layout is used). No such problems with a profile model however, the world is your oyster.

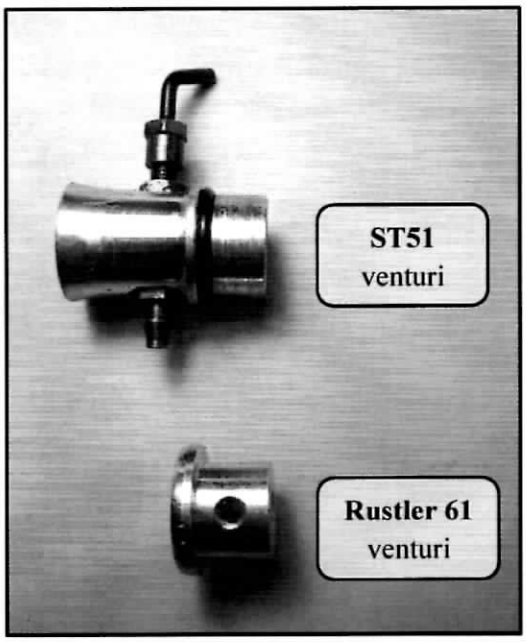
This height problem can stall many modellers at the outset as the needles on most engines seem to be set at ½". But all is not lost, I may have been lucky, but the first engine that I dedicated my life to was the ST 51, and surprise surprise, the needle valve on this engine gave me the exact height setting of 1" (see photo below). Better still the whole venturi assembly, with a little easing on a lathe, can be used on other engines as well, and particularly on my most recent favourite, the Rustler 61, which regrettably has a height setting as supplied of ½".

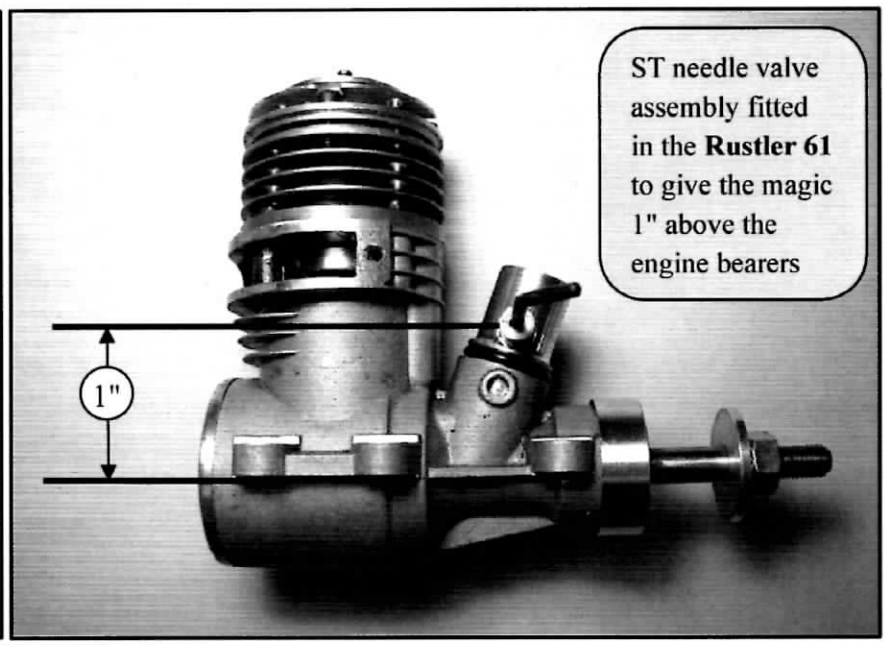


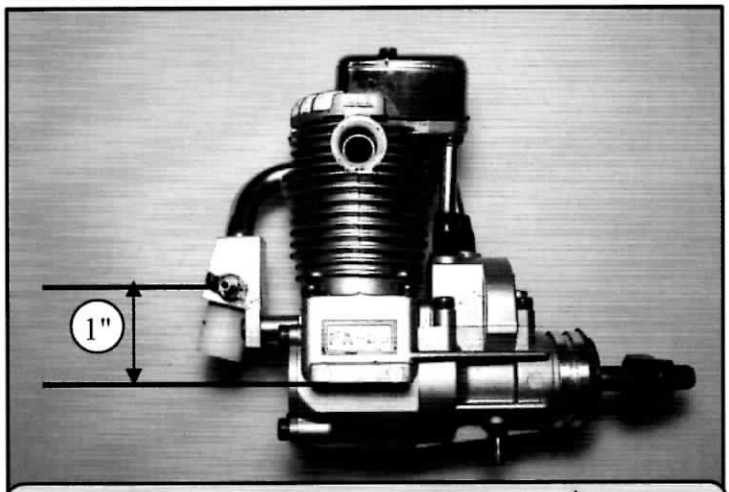
The Rustler 61 – as supplied, the needle is inconveniently set ½" above the bearers



The ST 51 - note how the needle valve is perfectly set 1" above the bearers



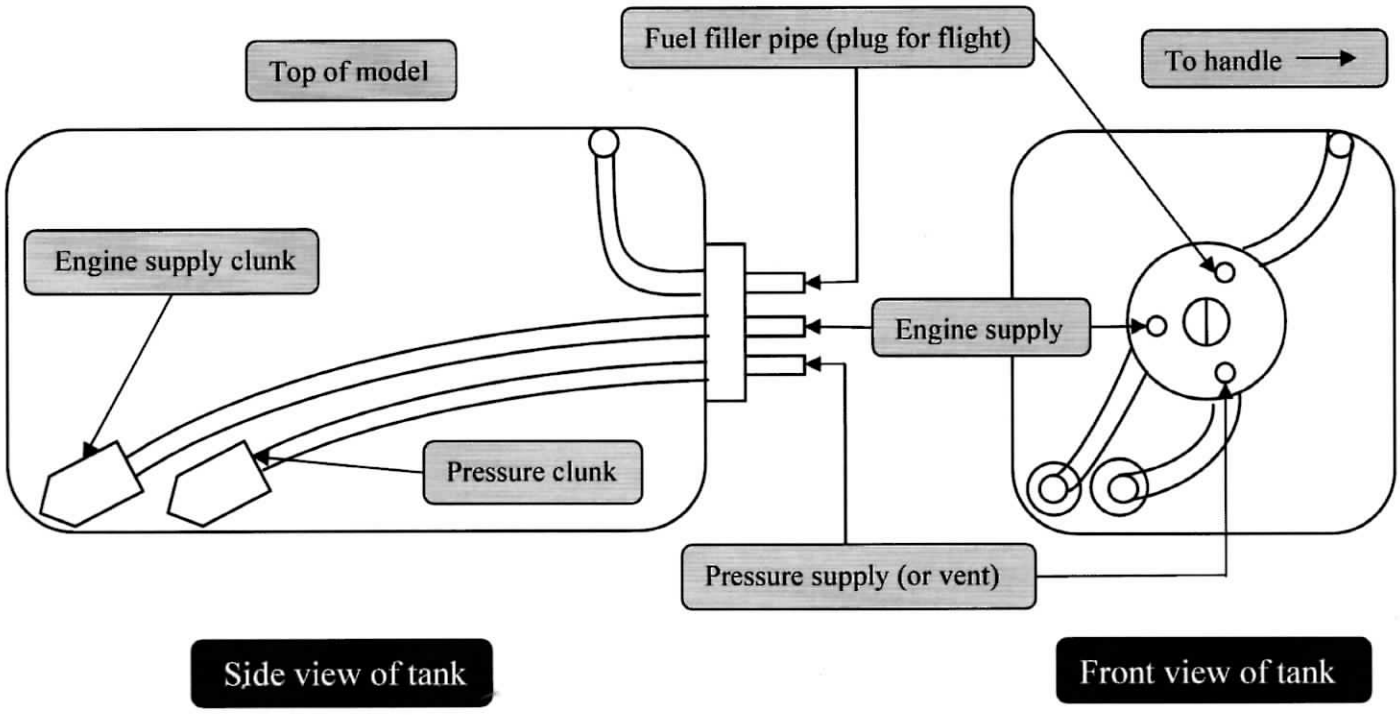




Even the **Saito 56 (or 72)** four-stroke with a fixed choke conversion provides the perfect 1" dimension

So, now that we've got the needle valve set to the critical 1" above (or below) the engine bearer height we can move on to the assembly of the Kavan plastic clunk tank. If you look at the heading photo showing all the tank components you will notice <u>two</u> Du-Bro sintered bronze clunks on the left hand side of the photo. These really are an important element and no other alternative substitute is acceptable. But why two? Because in this tank arrangement you will have an ongoing choice of the fuel being supplied to the engine either by straightforward suction OR by pressure from the silencer. If you opt for plain suction then you can just use the pressure clunk as an open vent.

Alternatively, connect the pressure pipe to a nipple on the silencer to run on pressure. The decision on whether to use plain suction or pressure is discussed in the next paragraph. The drawing below illustrates the pipe layout.

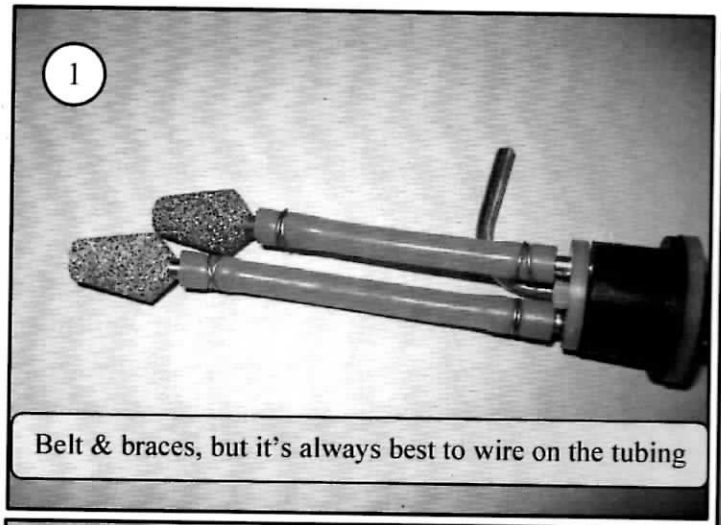


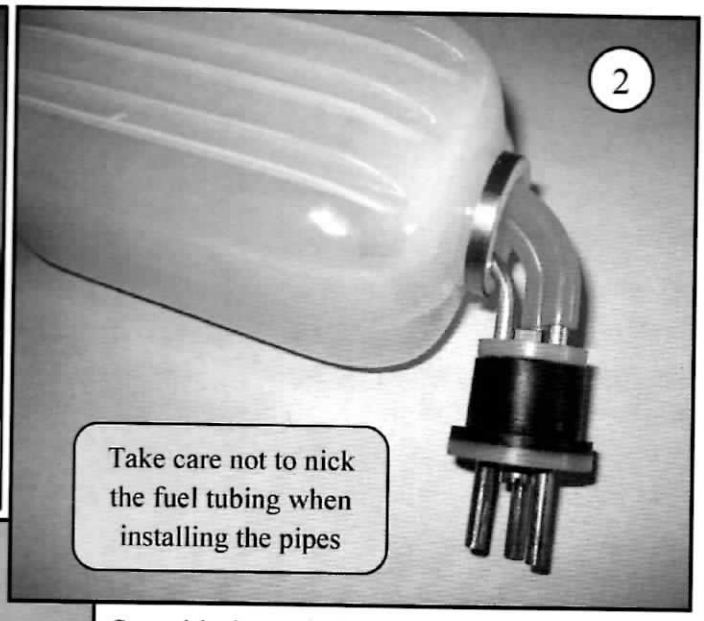
So do you opt for suction or pressure? The only real answer is to run some test flights out on the field and note which seems best, if there's no difference, then opt for suction, it's as simple as that. Certainly I found that my ST51 preferred pressure, whereas my Rustler 61 does not. No doubt the experts in our ranks can explain why.

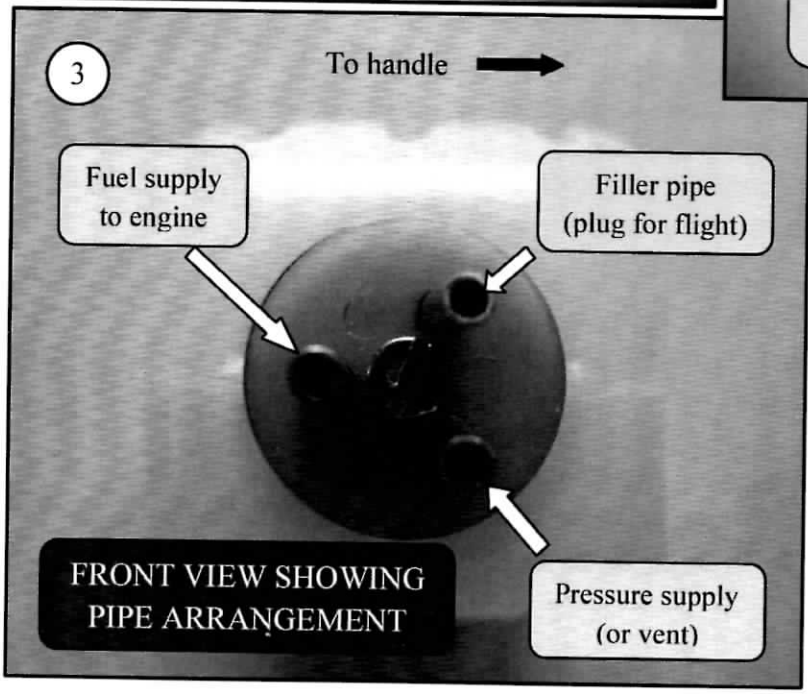
But before we can get to the flying stage we have to assemble the tank, which is where the TWO sintered bronze clunks come in. The chances are that your pressure supply will be coming from the silencer, but have you ever looked inside your silencer? It's not a pretty sight, an accumulated layer of thick black carbon is probably what will greet you. Worse, if you have ever studied the exhaust outlet residue closely after a flight you will have noted tiny black specks of.....carbon. And this is what you could end up pumping into your tank! And flyers then wonder why they have constant needle blockages and inconsistent runs.

With this Kavan tank arrangement any carbon specks coming through from the silencer are caught INSIDE the sintered bronze cluck as they enter the tank – so in effect the clunk is working in the REVERSE to the way it was intended. Any foreign objects entering the tank via the normal fuel filling process are caught by the other clunk as fuel is drawn up by the engine. Perfect!

The actual assembly of the tank is quite straightforward so just study the series of pictures below for the recommended procedure. Note that all the pipes are clipped onto the brass tubes with a length of fuse wire (see photo 1), belt and braces maybe, but they have been known to come off if left to their own devices! Take care when inserting the clunks and curved filler pipe through the mouth of the tank as it's quite easy to nick the pipes and make an invisible cut that will come back to haunt you at a later date (see photo 2). Incidentally, a little washing up liquid rubbed onto the rubber bung makes insertion into the tank a lot easier. Remember also to fit the brass ring around the boss on the mouth of the tank, this is important as it prevents the plastic from stretching when you come to screw up the rubber bung to achieve a nice fuel-tight seal. Photo 3 shows a detail of the pipes.







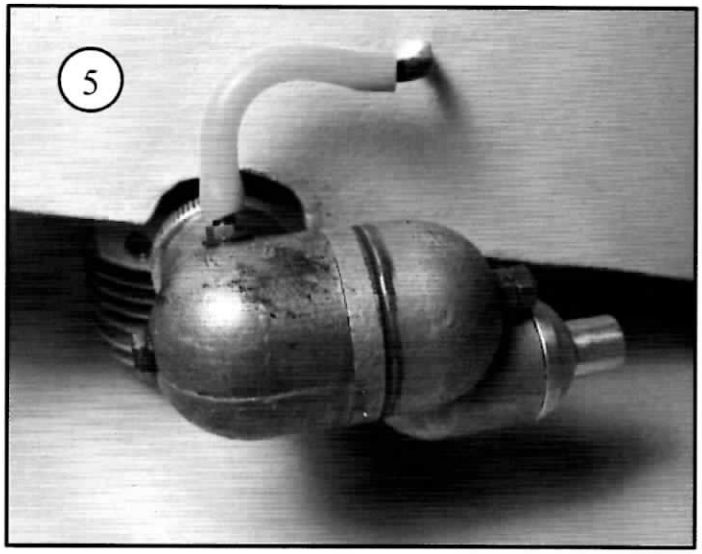
So, with the technical details taken care of, all that's necessary now is for you to settle the tank comfortably into the tank bay and to make sure that it's securely fixed in position.

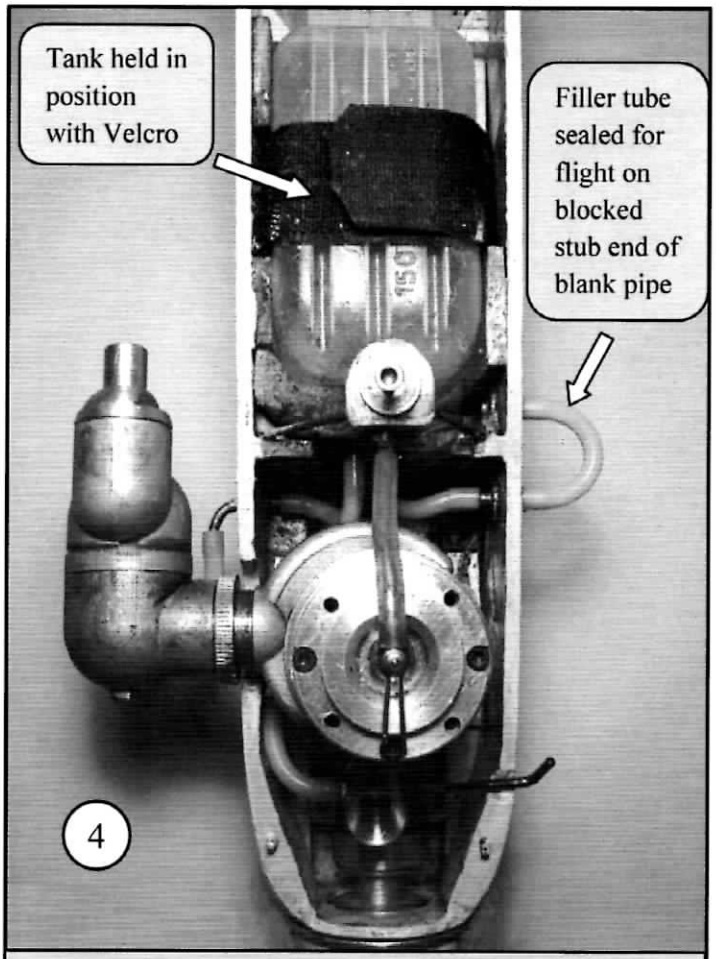
I've found Velcro to be ideal for this purpose as it's quick and easy to loosen for the inevitable tank height adjustments, so don't forget to make provision in your tank layout for some this balsa shims for packing the tank either up or down to regulate the engine speed for level and inverted flight (more about this on the next page).

Evo-Stick Impact adhesive is ideal for fixing the Velcro to the tank sides.

Finally, connect up all the plumbing, taking extra care here as it's very easy to connect up the wrong pipes. Always fill the tank through the dedicated filler pipe rather than the silencer pressure connection as this could lead to captured carbon being forced into the tank. And ALWAYS remember to plug the filler. I have a blanked off length of brass pipe permanently fixed to the side of the model immediately adjacent to the filler, so it's dead easy to form a U shape with the tubing to seal the inlet - see photo 4 at right.

The silencer pressure for my Rustler 61 was designed to be used as shown in photo 5, but flight experiments produced no advantage, so now the curved brass tube in the fuselage side just remains permanently open.





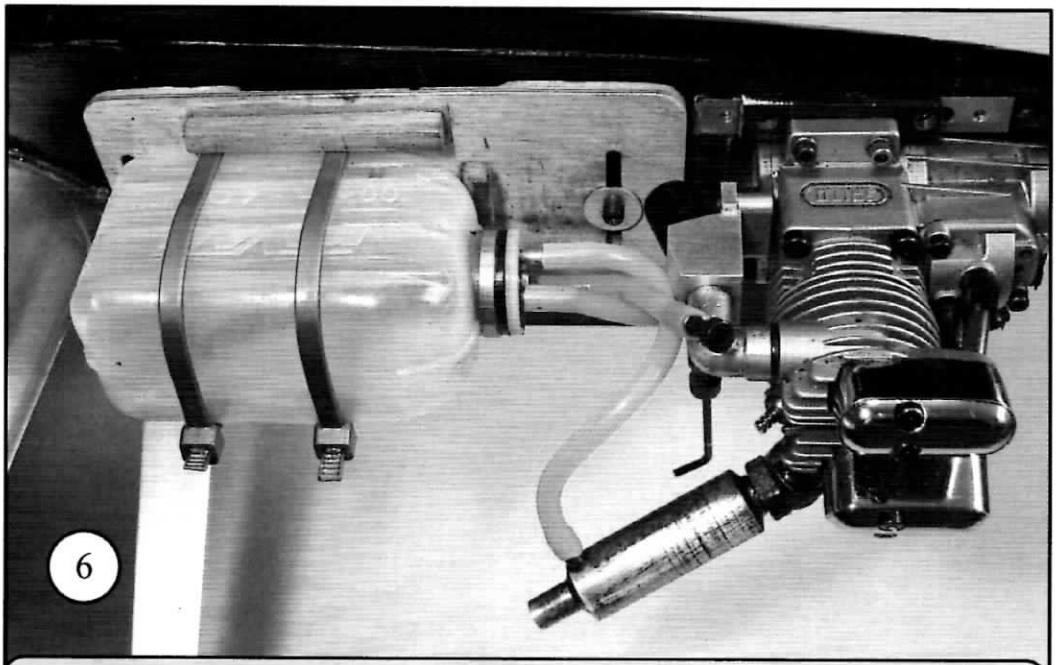
Rustler 61 installation showing the clunk tank fixing and exhaust pressure arrangement.

Out on the flying field your first task once airborne will be to check if you are getting an equal speed of engine run in both upright and inverted flight. If it's too fast in level flight relative to inverted then the tank height (and hence the head of fuel) needs to be raised relative to the needle valve, if it's the other way round, then drop the tank. Use the thin balsa packs mentioned earlier to achieve the perfect run.

Virtually everything mentioned in this article also applies to profile models, in fact in many ways it's easier as everything is so much more accessible.

Tank height adjustment can be facilitated by fabricating a simple ply tray – see the article in the May/June 2009 issue of Claptrap.

I've had great success with my baby Cardinal powered by a Saito four-stroke, but this time running on pressure – see photo 6 at right. So there you have it, a clunk tank for all reasons.



Saito 40 four-stroke with a 100cc Kavan double clunk tank running on pressure as installed in a 54" span 'Cardinal' profile model.