

V is for victory

Serpent Vector Review

The date October 17th, 1996. The test track M.A.C.H. Holland. The Driver Michael Salven. The car, Serpent Vector.

This all adds up to technical and engineering brilliance. The new 1/8 gas On-road car from Serpent had arrived. Twenty years of producing innovative model car designs culminating in this kit being reviewed. Serpent took a clean screen of pixels and designed it using the most sophisticated 3-D C.A.D. software.

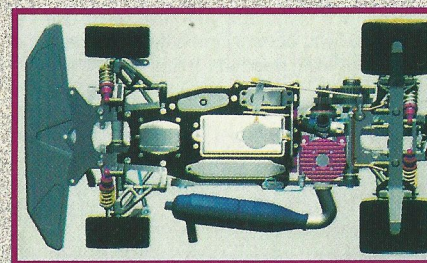
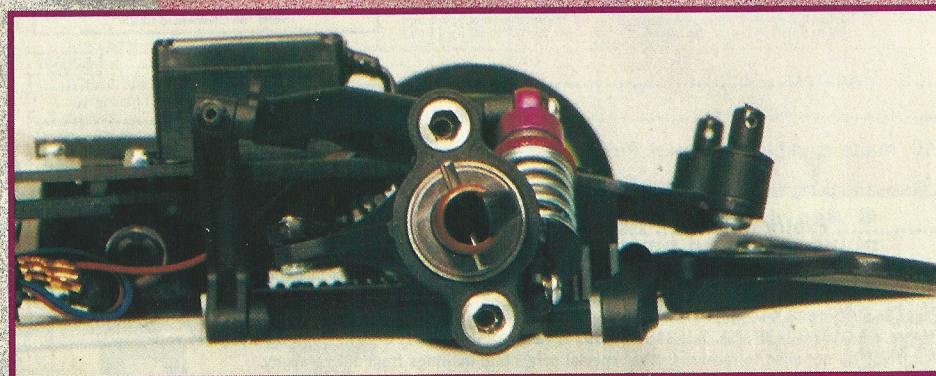
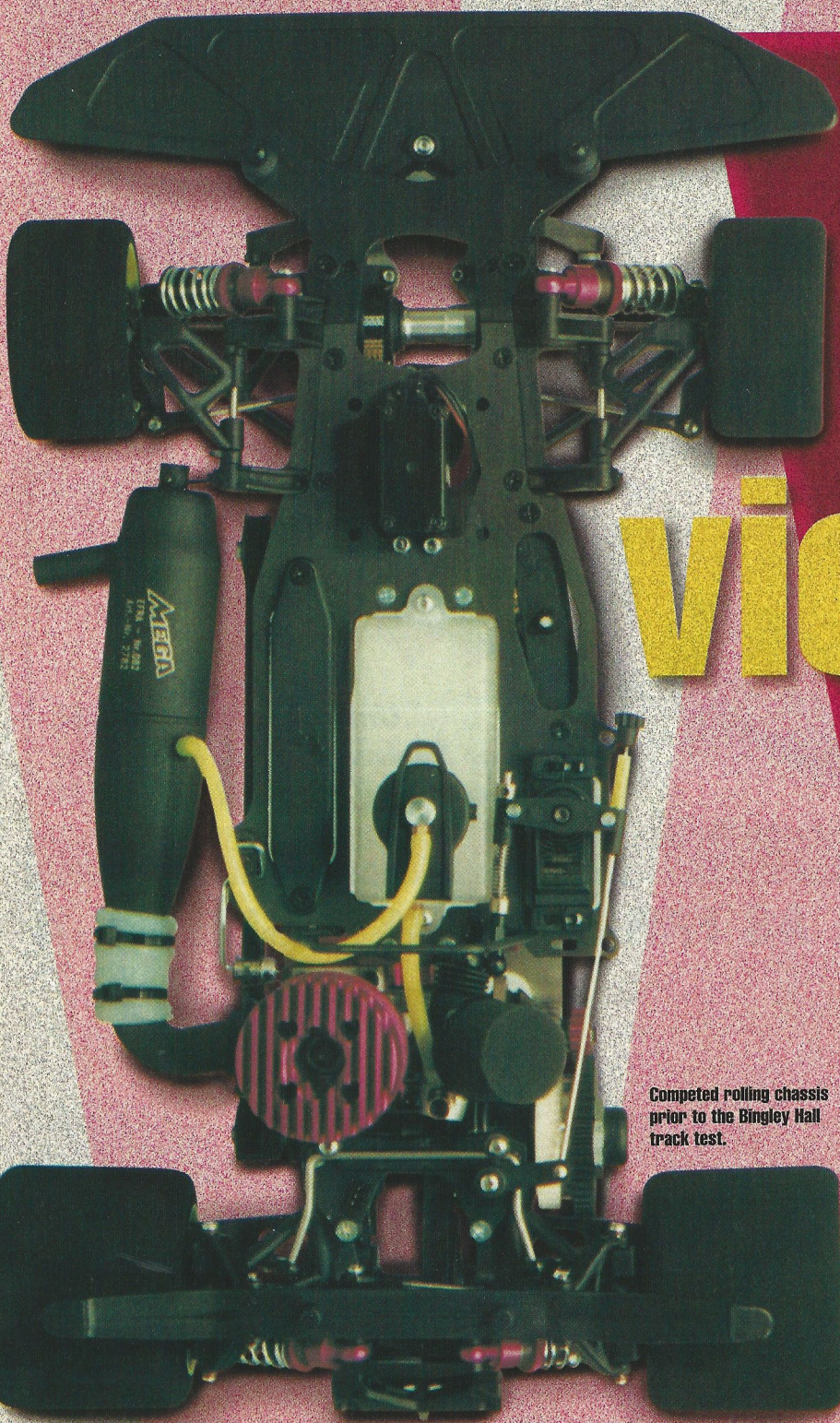
Every action, every contour, every part has been meticulously engineered and tested with one goal in mind, create the ultimate 1/8 4.w.d. racing machine. "V" stands for victory. The Vector is a completely "optimised" car and so should only need fine tuning to suit the on the day conditions. This car is not quite as mega adjustable at the rear, unlike the Excel, because it doesn't need to be. The adjust ability of this car almost takes me back to the days of my Serpent Sprint 6000 and that in it's day was a brilliant car (in my opinion). The adjustments that can be made are:

FRONT

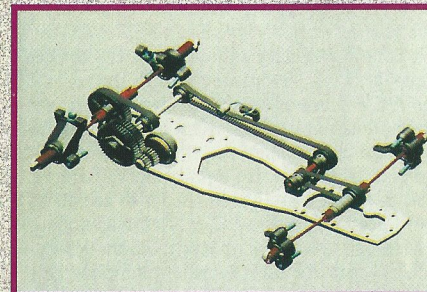
Caster, camber, ride height, anti rollbar, spring tension, toe adjustment, damping via adjustable pistons, or you can choose fixed hole pistons and the other main adjustment is front track width

Left: The captive ball-joints in the front up-rights can be clearly seen. Note the angle of the top wishbone, this stops the car jacking under acceleration, giving more power-on steering.

Competed rolling chassis prior to the Bingley Hall track test.



As seen on the internet.



The new three bolt layout.

REAR

At the rear you can adjust the camber, ride height, toe in/out, damping, spring tension, rear track is fixed, the anti rollbar is not adjustable.

To the review

So, onto the actual kit review. I collected the kit from Elite Models in December. I had a long chat with Walt Bailey about 1/8 racing in general and about the development of the Vector, but I won't bore you with that!

On opening the box I found the best packaging I have ever seen in any kit and I have built a few in my time. The chassis takes up the centre of the box and comes partly assembled, packaged in two separate boxes. You also get a set of trued and glued tyres. Mine were 38 front and 35 rear, and believe me, these tyres work extremely well. Also included in the kit is a P.C. format disc containing a simple data base for keeping a record of different

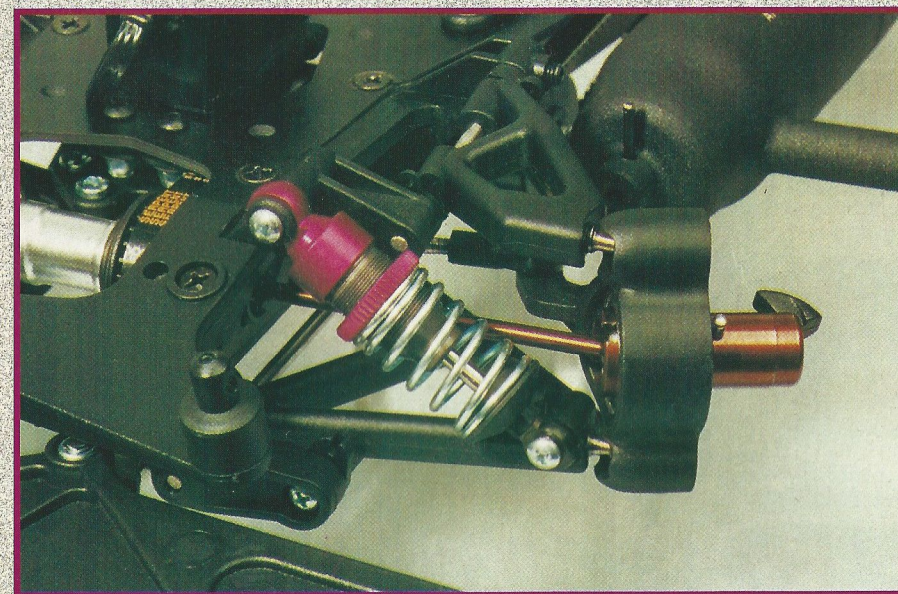
track set ups (I believe this is standard practice in all Serpent kits). To start the building you first have to disassemble the components

fitted to the chassis. The instructions supplied with the kit are all pictorial. The only written part of the instructions refer only to screw, shim, and bearing sizes

Assembly of the Car

Assembly starts at the front end and is relatively straightforward Starting with the suspension components the geometry allows full adjustment of all major settings. The system for adjusting the camber and track width is a system of pivoting balls mounted into the ends of the upper and lower wishbones. Adjustable plastic ball cups are fitted onto the metal balls and then capped with a 6mm alloy adjustment nut, which you then adjust to take out almost all the end float. No end float will leave the suspension tight and the steering "notchy"

Fit wheel bearings and front wheel drivers. Before fitting the wheel drive pin don't forget to fit the shim behind the pin. Assemble top and bottom wishbones into their pickup points on the bulkheads. After assembly if the wishbones don't pivot freely, remove them and try twisting the mouldings slightly to re-align them. Refit to wishbones and check that they drop of their own weight. If not, repeat the above process. This will pay dividends when you set up and run the car. Assemble the rest of the front end, noting where the 6mm grub screws for the down-stops are located. Don't forget to fit the caster shims. On my own car I fitted the two thicker shims at the rear of the top wishbones and the thinner one to the front. The final part of the front end assembly is of the anti rollbar. This may be a bit confusing to some of you as it was to me, so I will detail this a little more closely. On the L/H rollbar lever you have a concentric cam. This is fitted into a recess on the back of the rollbar lever and is retained via the self tapping screw that holds the lever to the bottom wishbone. This cam/lever adjusts the position of the anti rollbar, so no "tweak" or preload is built in, the final setting of this position should be done when the car is set-up. Fit the completed front assembly to the chassis with six 3.5mm self tapping screws (You have fitted the drive belt, and trans-axle haven't you!)



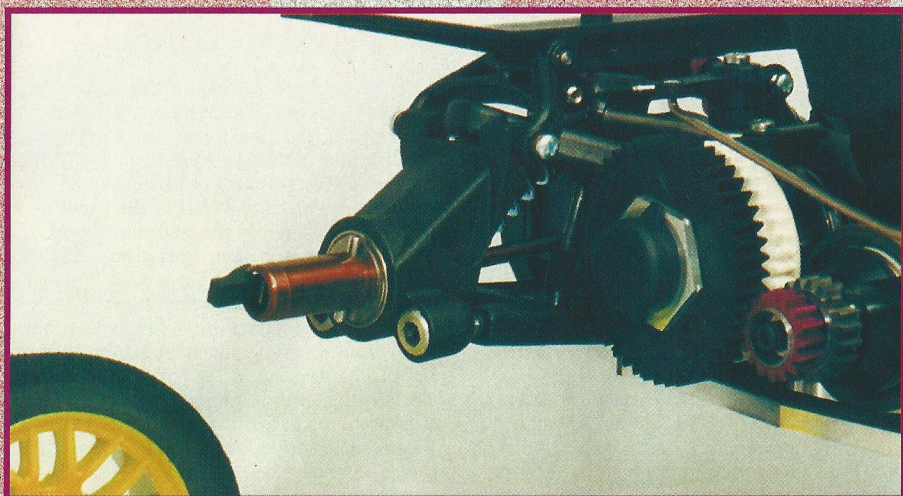
Note the roll-bar adjustment cam on the lower wishbone just below the body mount.

Middle Shaft

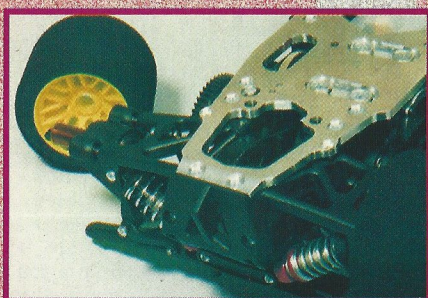
Fit the bearings to middle shaft carrier. Fit side pulley to the alloy adapter, it's probably a good idea to use a small amount of super glue on the pulley flats. You have a choice of which side pulley to use, these can be used to change the 4WD ratio and thus the handling. Start with the twenty five and run the car. Then try the twenty four (this gives slightly more power on steering) Use a good quality thread lock on the grub screw in the alloy adapter. Fit the pulley to the layshaft ensuring that you have the groove in the shaft on the right. Assemble the centre pulley into the carrier together with the belt and then slide the layshaft through bearings and centre pulley. Retain shaft with a 5mm c-clip. Fit the completed assembly to the chassis with four 3.5mm self tapping screws.

Shock Absorbers

The shocks are Serpents well proven units and you are given the choice of fixed pistons or fully adjustable pistons. I personally find that the adjustable pistons give a very good action and are quick and simple to adjust to suit different track conditions. The set up sheet in the back of the instructions give you a percentage of damping. To do this push the pistons right to the top of their stroke and twist until you feel them locate in the castigated top cup. Now screw in fully; that is 100% damping. Now unscrew fully; that is 0% damping. From 0% to 100% is approximately three complete turns, so to get 50% damping you screw in one and half turns. Simple isn't it? The only tips I will pass onto you regarding the shocks are as follows: when filling, push the pistons right to the top of their stroke. Now as you start to fill the shock slowly pull the piston down. Carry on doing this until the piston is at the bottom of it's stroke and the shock body is full of oil to within 1mm of the top of the body. Now slowly pump the piston to expel any trapped air bubbles. Do all four and leave them to stand for 15 mins. While you are waiting you can do some more work on the car. Now that you have left the shocks to stand, again pump the pistons very slowly to check for air bubbles. Hopefully there wont be any. Push the pistons to the top of their stroke and fit the diaphragms to the shock bodies. Now pull the pistons down very slowly. This will pull the diaphragms down at the same time (suction) Stop pulling when the diaphragms are flush with the shock bodies. Now put aside. The other tip on the shocks concerns the shock body caps (part No 9404). If you have the facility and a 1.5 mm drill bit, put the cap in a lathe and drill a hole into the cap body and into the pivot hole. This simple job will make your shock action much smoother because you don't have air trapped above the diaphragms and between the shock caps. Some people won't agree with this but it works for me. Now screw the caps to the bodies and check for air. Assemble the front and rear shocks fully and ensure that both front shocks are the same length and that both rear shocks are the same length. Fully assemble the shocks ensuring that the short springs are fitted to the front shocks. Take your time doing the shocks as this is the heart of a good handling car.



Screw on alloy pinions are now used on the Centax clutch bell, this makes gear changes quicker and cheaper!! Also there are a new range of gearbox gears.

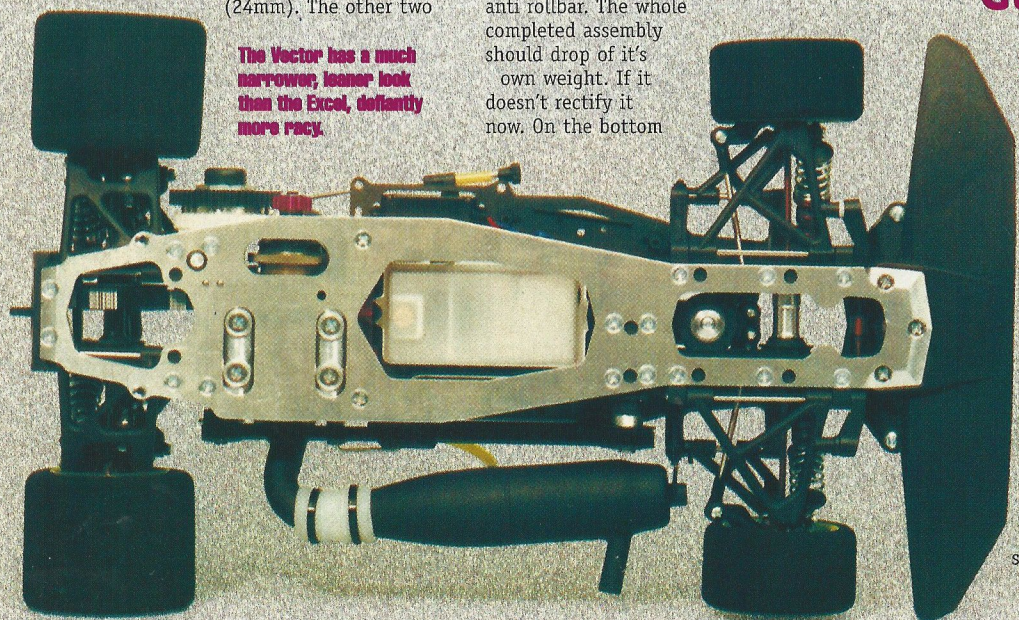


A completely new rear suspension is fitted to the Vector, look's very similar to the Impact 2, lower adjustments and the rear track width are longer being adjustable.

Rear End Assembly

At the rear assembly is a little more complicated, as this is where most of the action happens. I am not going to give you a part by part build up of the rear end but guide you through some of the more complicated bits. The rear bulkheads are marked "L" and "R". Two rollpins are fitted into the right hand bulkhead. These are to hold the disc pads in place. Tap them through until they are flush with the outside of the bulkhead. The two pins you should fit are the longer ones (24mm). The other two

The Vector has a much narrower, leaner look than the Excel, defiantly more racy.



of both lower wishbones you have to fit two mushroom head bolts, these adjust the ride height at a later stage in setting up.

Two Speed Gearbox

This gearbox deserves a special mention in it's building and setting up. The unit provided in the kit is Serpents well tried and reliable unit. It is of the two shoe type and works every time if it is built correctly and set up in the correct sequence. I will guide you through the assembly of the shoes as this will make the final setting up and adjustment, when completed, easier for the novice. Take the two shoes and paint the recessed holes with light coloured paint. I used dayglo red and green (easier to see at my age) Once dry, fit a spring to each mushroom headed bolt (M3 x 16mm long). Fit the M3 nylock nut into the recess in the other shoe half and screw in the mushroom headed bolt, together with the spring by two complete turns only. Repeat this process for the other screw. Now take the two speed adapter (part No. 6647) and fit into the recess in the middle of the two shoes. Now take one 4mm ball and drop it into the hole in the top of the shoes. Now fit the M6 grub screw into the same hole (do remember to put grease on the balls) and screw them in until under flush. Now fit the drum to the shaft and then fit the two speed locating pin (this is a very tight fit) and must be fitted centrally. Fit the fully assembled two speed shoes into the drum and locate on the drive pin. Once you have done this, turn the drum until you find the hole that is used for adjusting the shoes. Take a 4mm allen key and locate into the grub screw. Turn the grub screw in until the shoes "drag" on the drum until you can only just turn it, and then back them off until the drum turns freely. Repeat this process on the other shoe. Now remove the shoes from the drum and screw in both mushroom headed bolts (the ones in the painted holes) until the bottoms of the heads are flush with the recess. Continue to screw them in a further two complete turns. Assemble the rest of the gearbox as per the instructions and fit the completed rear end to chassis with the self tapping screws provided.

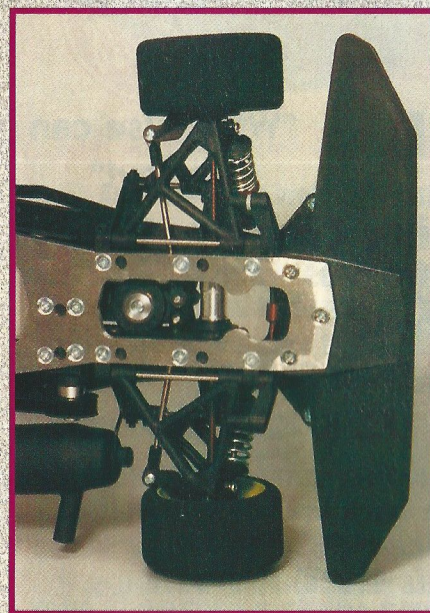
Clutch Assembly

The kit comes complete with the very reliable Centax Clutch. The instructions show a very good diagram of how this unit is constructed. Now this is where I have the biggest criticism of this kit, in that there are no instructions for setting up this clutch and this has to be done correctly, otherwise the clutch will slip excessively or will not engage at all. In my opinion Serpent should not have released the kit to their Distributors until all the relevant instructions had been printed and put in the boxes (Ed's note— All the current Vector kits now carry full instructions and set-up sheets, John's kit was a very early one). Elite Models will help the Purchasers of the kit with any information that he or she may need on setting up this clutch (Moan over!) The

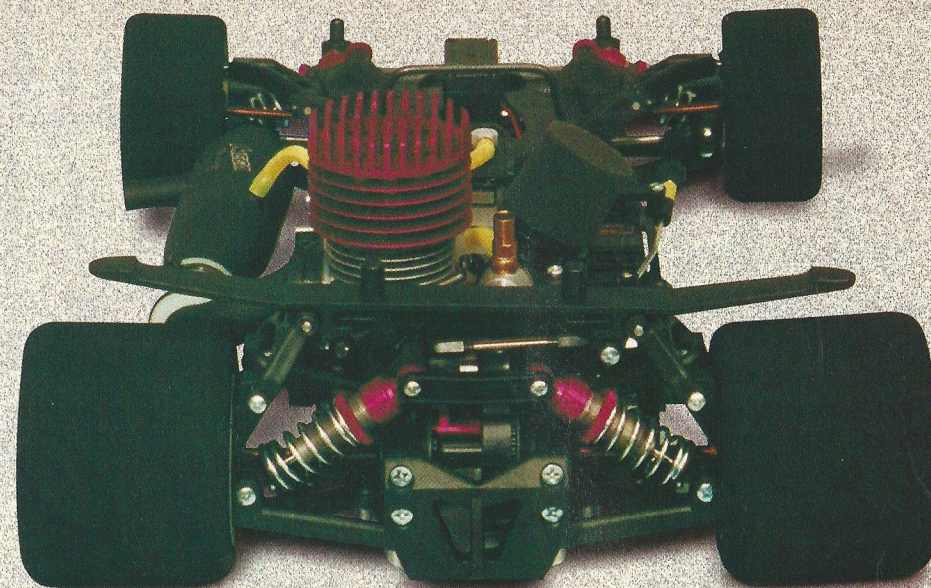
kit is also supplied with a Centax clutch bell that has screw on pinion gears. This saves the customer from having to spend money on different clutch bells. You just buy the gears and screw them on. Once the clutch assembly is fitted to the engine and set correctly it will prove to be a very reliable unit. Fit the completed clutch/engine assembly to the chassis and mesh in the gears.

Radio Plate

The radio plate supplied in the kit is made of carbon fibre and therefore very light and strong. There is plenty of room for any commercially available radio gear and the instructions are clear on how to do this. I will mention at this stage the fitting of the tank which in turn is mounted to the radio plate. You have to put a sleeve of fuel tubing into the mounting lugs and then screw the tank to the radio plate. You are also given the choice of whether you have the pressure take-off mounted in the filler neck or mounted on the filler cap. In my opinion it is better to mount the nipple on the filler cap. The reason for this is to avoid the risk of fuel blocking off the pressure nipple on high speed corners, which would case the engine to momentarily run lean, but which ever method you choose, once mounted the tank should not be over tightened but left fairly loose. This is to avoid the risk of fuel frothing (anti vibration) Once you have fitted all your radio gear, mount the radio plate to the chassis with four 3.5mm self tapping screws at the front and two 4mm counter sunk screws at the rear. Once you have mounted the radio plate you can then fit the side drive belt. This belt takes the drive from the rear to the front. Having fitted the belt you can then mount the belt tensioner, provided in the kit, to go under the tensioner is a plastic top hat spacer which provides the tension for the belt. This is not adequate and on mine I had to fit a short length of fuel tubing to tension the belt correctly. Make up the throttle/brake linkage (supplied in the kit). In the Vector at long last Serpent have supplied turnbuckle type track rods. Fit front and rear wheels. These are extremely attractive and



The latest chassis is 6mm thick, but unlike the Excel the chassis is not machined to lower the suspension, the Vector has had the geometry designed for the thicker chassis.



All the downforce that the body creates is transferred straight to the track, courtesy of the new body mount.

strong hubs and are styled on B.B.S. wheels. With the wheels fitted you are now ready to do the final setting up.

Setting Up

Before you start to do the set-up of this car check that the front tyres are of equal diameter and the same for the rears. If you look at the bottom of the chassis a small hole has been drilled at the front and rear. I use this hole to locate the car on as it has been drilled on the centre line and is very useful for setting up. Begin by disconnecting the front shocks then lift up the front of the chassis with something pointed. This shows if the front anti rollbar is true. If one wheel lifts off before the other, adjust the cam on the right-hand bottom wishbone, by a small amount at a time until both wheels come off together. Then reconnect the shockers and again lift the chassis. Again both wheels should come off together. If not alter the shock length of one or the other. Refit and recheck. Now you can adjust the front ride height. To do this you will see two holes on either side of the front bulkheads. You have previously fitted two 6mm long grub screws into these holes. This is what controls the front ride height. Adjust these so that you have 6mm clearance under the front of the chassis. Now set the down stops on the lower wishbones so that the chassis has 1mm ground clearance on full compression. Make sure you do these adjustments equally and again lift the chassis to ensure that both wheels lift off at the same time. You can now set the track width. This is done by locating a 3mm allen key into the top and bottom pivot balls located in the steering blocks. Set the track width to 253mm. Next set the camber to minus 1° at ride height. This should be 0° with the wheels clear of the surface (which by the way should be level to make these adjustments). The next adjustment is tracking. This should be set to 0° i.e. no toe out or in (in other words parallel) and the final front adjustment is for the front anti rollbar. That completes the front end adjustments. At the rear, things are much easier, so start with disconnecting the anti rollbar links and the rear shock absorbers. Lift the chassis at the rear. Both wheels should lift at the same time. If not adjust the ride height screws on the lower wishbones. These are accessed through holes in the chassis. Use a 2mm allen key to adjust these. Unscrew to raise the wishbone, screw up to lower. Re-connect the anti rollbar links and

again lift the chassis. Re-connect the shocks and again the wheels should lift at the same time. If not adjust one or the other shock lengths. Now set the rear wheel toe in. To do this insert a 3mm allen key into the front lower pivot ball. Use a straight edge across the back wheels and at the outer edge of the tyres. Adjust the gap to 2mm on each wheel. Next set the ride height to 6mm and again lift the wheels clear and check that they both lift at the same time. Next set the camber to 2° at full suspension deflection. To set the camber you again use a 3mm allen key and screw both lower pivot balls in or out by the same amount until you have set the correct camber. The only other setting to be done is the damping rate, but you should have been done during the build stage. The fronts should be set to an initial 70% and the rear to 50%. This setting is for medium to high grip tracks only. For low grip tracks you will need to soften the damping and geometry to suit. That covers the build and set up and I hope that this review and settings have been fairly clear. I really did enjoy building this kit. Nothing had to be drilled or filed in all an excellent product from Serpent. But please Peter if you read this review, put some instructions in the kits and please send me mine (I did send you the form)

(Ed's note..... When John built this kit up no set-up information was supplied with it, this Serpent have rectified. The set-up routine John followed works for all cars, however the Serpent recommended procedure should be used as this will guarantee a good handling car from the word go)

Track Test

The first race I did with this car was at Bingley Hall in January and after setting the car up to suit the track I made the "B" final and finished third. That tells a lot about this car because I hadn't raced competitively for over six years. The set up I have given in this review are the ones that I have tuned the chassis to, to suit my own driving style. This however, is not the set up in the back of the instructions given by Michael Salven - try his set up first. **MC**

The kits are available now from Elite Models - phone 01623 636062. Kit price £495.00 or an engine kit deal which includes the powerful Mega SX21 engine, pipe and manifold for £695.00.

That means you get the engine manifold and pipe for £200. Good value in these days of rising costs. See you at trackside.