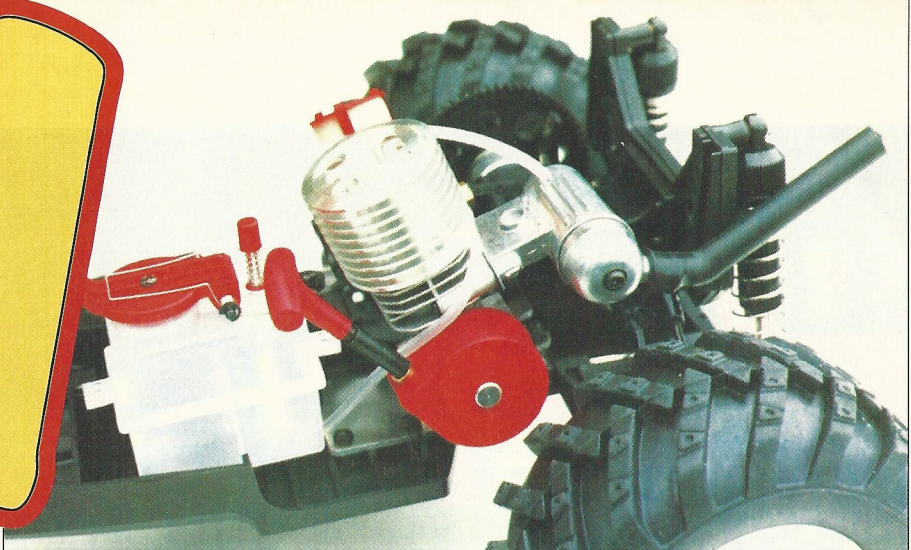


Building and running Kyosho's Toyota RAV 4

RAVE ON!

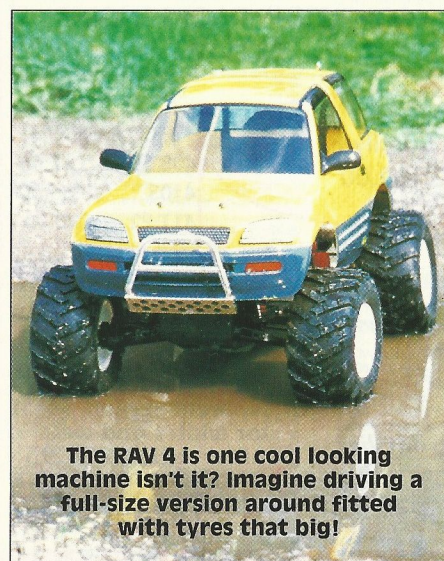


For me, the attraction of this new 1/10 scale kit from Kyosho was undoubtedly the promise of a simple to build and easy to run gas (IC) car, and with the RAV 4 being my first ever gas powered car, I was eager to see if it was as easy to start and run as Jonty the Ed assured me it would be.

Big Box!

The RAV 4 arrived in a large and sturdy box, the partially assembled moulded plastic chassis and huge balloon tyres taking up most of the room! The RAV 4, which I believe stands for Recreational All-Terrain Vehicle, is powered by a .10 class GS 11X glow plug engine, fitted with a recoil pull-starter for easy starting, very much like those found on lawn mowers, and comes with a clear polycarbonate body shell. This requires painting and the application of some smart stickers to make ready for use. More on this a little later.

To complete the RAV, all that was needed was a set of 2 channel radio, a glow plug heater and some glow fuel (despite often being branded as 'petrol' cars, small scale cars like these DON'T run on petrol, so don't even try it, it isn't safe - I would recommend glow fuel with a minimum of 10% nitromethane. Ed)



The RAV 4 is one cool looking machine isn't it? Imagine driving a full-size version around fitted with tyres that big!

The RAV 4 bodysell certainly makes for a different looking vehicle compared to the 'Truck' style bodies normally fitted to big-wheeled cars.

Assembly

Assembly of the basic chassis was easy, after all most of the hard work, such as the installation of the engine and suspension, had already been done at the factory. All I was left to do was to bolt on the ancillaries and add the radio gear. My limited contribution to the RAV 4's construction began with the fitting of the radio gear, starting with the fitting of the two servos after having first tested the system to obtain neutral settings on both servos. The radio gear I was using had originally been fitted in an electric buggy using the BEC system. To enable the radio to work in the RAV 4, all I had to do was to buy a small

battery box and batteries for the receiver to act as a replacement for the electric car's main battery, and this cost me just £1.20 from the local model shop.

The servos fitted reasonably well, although I extended the slot in one of the throttle servo mountings to let the servo lead pass through. Presumably this problem wouldn't have arisen if I'd used a dedicated radio system.

The battery pack, switch and receiver were added next, and again there were no problems, in fact, having fixed the receiver to the removable battery box top with double sided tape, this

turned out to be very useful during tests when the receiver got extremely wet and then needed to be removed to dry it out.

The loose lengths of wire were tied together with cable ties, then slipped down the side of the battery box and throttle servo to tidy them up and prevent them straying into any of the working mechanical parts. The throttle and brake linkages were added to the throttle/brake servo, taking careful note regarding the positioning of the link arms in the servo horn holes. At this point it's worth mentioning that the instructions are very clear and simple to follow, making the job of assembly very easy, but the initial test runs showed that the suggested geometry of the throttle/brake linkages is less than ideal, and I am seriously considering taking them from a single leg servo output arm or disc rather than using the

90° arms as suggested in the instructions. Another area that could do with a little attention is the brake linkage. The brake rod could do with being a little longer to allow the use of either a piece of silicone tubing or a small spring to be fitted between the collet and the brake lever. This would take the 'fierceness' out of the brake's operation, and also reduce the chance of the servo stalling due to the difference between the servo's travel compared to the brake levers.

The aerial should be fed through a hole in the bodysell's roof, but as it only extends through the roof by about 30mm, I decided to tie the aerial to the rear body mount and keep it within the bodysell. To do this, I simply cut off about 20mm of the aerial tube (not the aerial!) and then threaded the excess aerial wire through one of the lower holes in the body post, causing the aerial tube to bend over a little like a bow. This resulted in an effective aerial,

kept tidily under the shell and doing away with trying to thread the aerial through the tiny hole!

Once the radio system had been set up, I turned my attention to the suspension. The main suspension parts are pre-assembled at the factory, so all I had to do was build the four oil-filled shock absorbers and fit them to the suspension. Assembly of the shockers and their fitting to the chassis is quick and simple, and anyone who has built an electric buggy will be quite familiar with the sequence.

Nearing Completion

To finish off the running gear, all I then had to do was to fit the huge balloon tyres to the rims and then fit the body posts. Now, I must confess that of all of the electric cars I've built, I have never superglued the tyres to the rims, never having lost a tyre off a rim using 'conventional' Off Road wheels and tyres. The monstrous tyres used on the RAV are a different matter altogether. Test runs soon revealed a tendency for the tyres to roll off the rims quite easily, so out came the super glue - lesson learnt!

The body posts slot into place quite easily. My

The heart of the matter; Kyosho's little GS .11X, fitted with a very effective pull-starter. The rubber pipe extension on the exhaust exits at the rear for even more realism in action! The carburettor's priming pump can be seen just behind the fuel tank's lid. Simply press it down until fuel reaches the carburettor, at this point the pump becomes hard to depress. Attach the glow plug heater, then pull the starter handle. A few brisk tugs should see the GS11X ticking over nicely!

initial thoughts were that they were a little too delicate, and that a heavy roll might cause damage. Having so far performed everything in the aerobicic book including my own version of a triple roll complete with back flip, none of the rolls and crashes the RaAV has suffered to date have resulted in any damage. You can't beat destruction testing, especially when nothing gets destroyed!

All that was then needed to complete the RAV was to trim, paint and decorate the bodysell and fit it to the chassis. I must start off by saying that if you are expecting to achieve a finish like that shown on the box top, you are in for a lot of hard work. Due to the realistic manner in which the shell has been moulded, especially around the window frame area where black is required, it's quite awkward to mask off the frames and get a nice neat line. Perhaps a set of 'stick on' window frames to be applied to the outside of the shell would be a better solution. On the other hand, you could just 'forget' to paint them on the inside and use a black permanent marker pen on the outside instead!

In general the shell was easy to trim to shape, but as the RAV is intended for real beginners, I think it could have been better if the holes for the body posts and accessories had been taken care of at the factory. After all, drilling holes in a polycarbonate shell isn't the easiest of tasks if you don't have the right tools...

Once the frames were finished I masked off the lower half of the body, but again the masking line, especially around the rear of the shell, isn't ideally suited to a beginner. The instructions call for the lower half of the shell to be painted black, but the real RAV 4 has dark grey mouldings on the lower half. With this being the case, I plumped for grey rather than black, and besides, grey highlights the rest of the stickers a little better! The remainder of the shell was painted bright 'Banana' yellow, nicely complementing some of the stickers on the sheet.

The painting finished, I started placing the stickers on the shell. This was a nice simple task, trimming round the stickers best completed with a nice sharp scalpel rather than a pair of scissors.



With tyres like this, the RAV 4 goes over most obstacles without too much trouble. The bodymounts look spindly, but cope well with abuse. It's great fun throwing the RAV around on gravel for 15 minutes at a time!

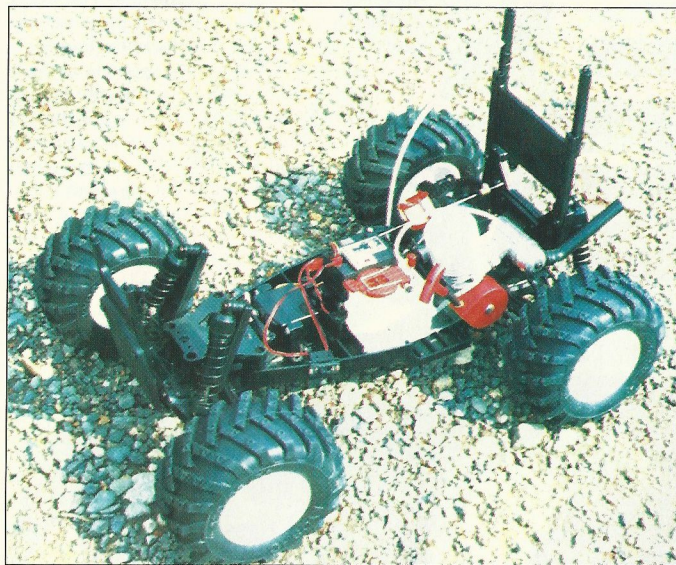
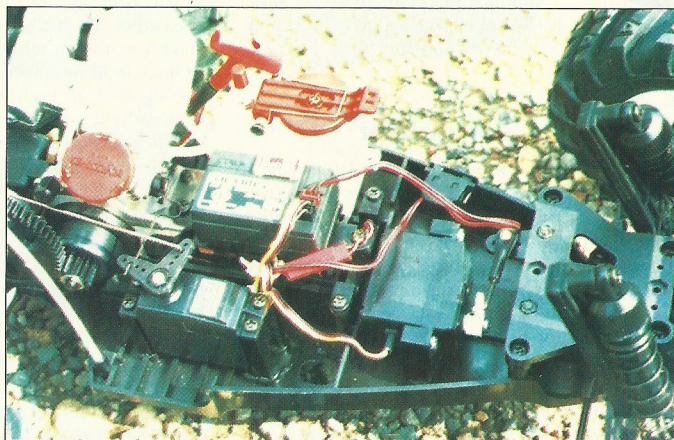
The instructions regarding the placement of the stickers are very easy to follow, with each of the stickers keyed to the illustration on the instruction sheet by numbers.

Finally I added the plastic 'bull bar' to the front, the spare wheel cover to the rear, and the door mirrors. The mirrors are easy, the bull bar is pretty simple, but the spare wheel cover was awkward to trim, so care is needed here otherwise it will end up smaller than was intended, as mine did!

I thought the attachment of the bull bar to the bodyshell rather than the chassis was a little strange, because A) due to the RAV's shape it is awkward to pick up, and B) a bumper or the bull bar fixed to the front of the chassis would be a much better and more practical idea, and would provide a much needed bumper, because after all this is a beginner's car and sure as eggs are eggs, beginners will crash at some point! (even the Ed crashed it during his 'vigorous' testing session!).

Running In

Well, the RAV was complete, so all I had to do now was run it. Would the RAV 4 live up to its promises? With the Ed on hand to offer advice, and with the tank filled to the brim, I pumped the priming button to get some fuel through to the carburettor, attached the glow supply to the plug and pulled the starter handle several times. Not a peep - Enter the Ed. He immediately saw that there wasn't any fuel getting to the carb because the needle valve was fully



closed, rather than the 1 1/2 turns open suggested in the instructions. Oops! Having set the needle as directed, one quick prime and three or four pulls on the cord saw the engine burst into life. After warming it up by blipping the throttle gently for a minute or so, the tickover speed was increased by turning the throttle barrel's end stop in until the little engine sat there turning over quietly on its own - the RAV 4 was

running sweet as a nut! A quick word of advice. When buying your starting accessories, make sure the glow plug heater is long enough and small enough in diameter to fit down inside the finned cylinder head, and that your plug spanner is also long enough to reach.

Over 15 Minutes Of Fun On One Tankful!

We initially ran the RAV around our large front garden without the bodyshell fitted, basically to ensure the engine got all the cool air it wanted, and after two tanks of fuel the performance began to improve noticeably. Jonty the Ed then suggested leaning the mixture a little, which I did by just under 1/4 of a turn (screwing the needle in clockwise), then the performance was quite creditable for a 'fun' car. The course we used incorporated short grass, longish grass and a long gravel driveway. The RAV 4 undoubtedly preferred the gravel, offering a much higher top speed and better acceleration.

The massive balloon tyres and softish suspension easily coped with smallish jumps, but a severe 'ski jump' only resulted in the car going end over end! Due no doubt to its high centre of gravity, the RAV 4 will also tip over fairly easily in the hands of the inexperienced (me!) but this all added to the fun. As it turned out, sliding about on the gravel was great fun, and running the whole length of the drive going from one lock to the other trying to keep the RAV in a straight line was a great laugh!

As I said earlier, the RAV 4 is my first venture into the World of IC powered cars, and I loved it. I have to give the RAV 4 the thumbs up, it's pretty simple to build, apart from the aspects mentioned about painting the body shell, and is really simple to start up and operate if the instructions are followed to the letter. I'm still not sure if I would recommend this kit to the absolute beginner just starting out in radio control cars, but like myself, if you've successfully built and run an entry level electric car before, I don't think you'll find too many problems. The most positive aspect is the running time: One tankful of fuel gives over 15 minutes of FUN, and for any father fed up with his son bemoaning the short amount of 'play time' allowed by his electric car, this just has to be the answer...

The Kyosho RAV 4 has certainly converted me to gas powered cars, it's literally fired me up and I want something faster now!

The Kyosho RAV 4 is imported and distributed to the trade by Ripmax, Ripmax Corner, Green Street, Enfield, Middlesex. Tel (0181) 804 8272.

This view shows how simple the RAV 4's radio installation is within the moulded 'tub' chassis. Easy access to the radio, engine and transmission means cleaning and maintenance is a simple matter.