



Super slicks and the V groove radials.

HPI Scale Touring Car

Revisited

Dez Chand



Gearbox stiffening plate.

Having saved all this weight and improved the overall condition of the car with carbon this and stainless that, you can either go sticking ugly lead blocks all over it to get it back up to the legal weight limit that it was already just under in fighting trim or take up a couple of options to pertain that little something extra that we are all striving to find these days.

Roll Bars

Anti-roll bars allow fine tuning of the chassis by limiting the amount of roll mid corner and hence the amount of weight transfer into and out of the said curve. A stiffer rear anti-roll bar will induce a little extra oversteer that will help you negotiate a tight and twisty circuit while a stiffer front anti-roll bar will induce a touch of under steer - useful on longer sweeping tracks. Stiffening the rolling

So you think your RS4 is the Bees knees and are prepared to lavish abit of time and money on it now that it has proved itself worthy of the attention. Too right!!

Top of the list

Top of the list has too be an entire car set of ballraces, some 24 pieces in total, to remove all the friction from every rotating component and liberate a couple of horses previously occupied with battling the kit bushings. There are six ballraces to go into the rear gearbox (layshaft, idler gear and diff mounted), four in the belt guide and tensioners, two mount the front diff in its housing and two each of the four stub axles. That's only 20 ballraces I hear you cry, go to the top of the class in math, but to really finish off the drive line why not go the whole hog and install the two in the centre of each diff to present the kind of smoothness usually reserved for draft bitter. If you are gonna do it, its worth doing it all.

Fitting all these to a previously run car is not a long job but will none the less require a complete strip down and rebuild so while you're at it why not consider some of the other go-faster goodies in the HPI range of genuine after market accessories.

Let's do the job properly

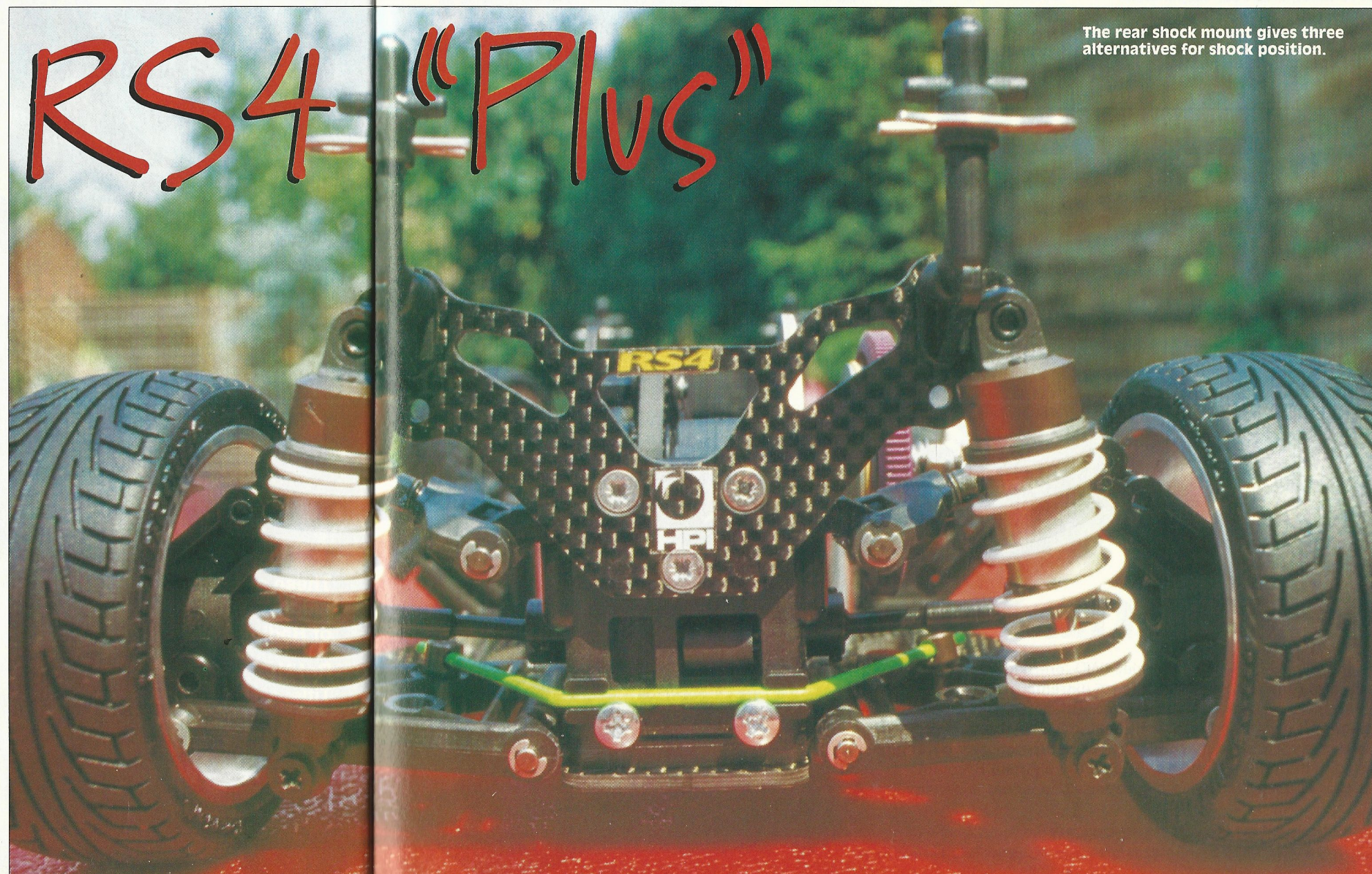
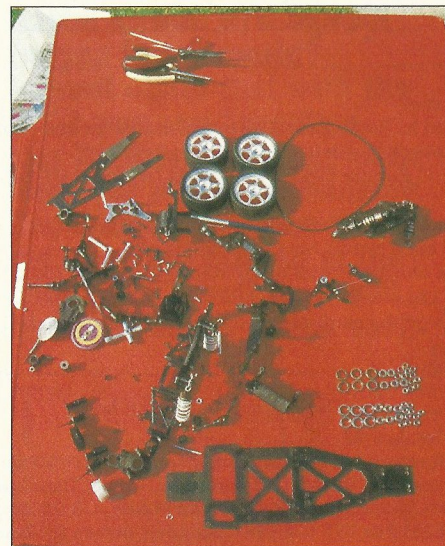
As a pair, the carbon top deck and main chassis lift the image of the car straight into another dimension, while saving 18 grammes over the original equipment and tripling the torsional stiffness of the assembly. A carbon gearbox brace to replace the aluminium standard item similarly saves a little weight and adds stiffness whilst complementing the expanse of graphite in the rest of the chassis. The other side plate of the gearbox must stay aluminium as it offers a better heat sink for the motor mounted to it than carbon ever could. The kit rear shock tower is a plastic moulding that can be replaced with a dashing piece of carbon that not only offers a lighter, stiffer mounting but increases to three the number of top mounting positions for the rear shocks to offer even more tuning options than before.

As standard all the suspension arms pivot on mild steel pins (the inner pivots front and rear, upper and lower plus the rear outer lower connection to the hub carrier makes it a set of ten pieces), with button heads and circlips on the opposite ends but now these can be upgraded to stainless steel pins with circlips both ends to allow removal in either direction. Stainless steel is not only corrosion resistant but harder, stiffer and yet a little lighter than mild steel so it wins hand down in every department.

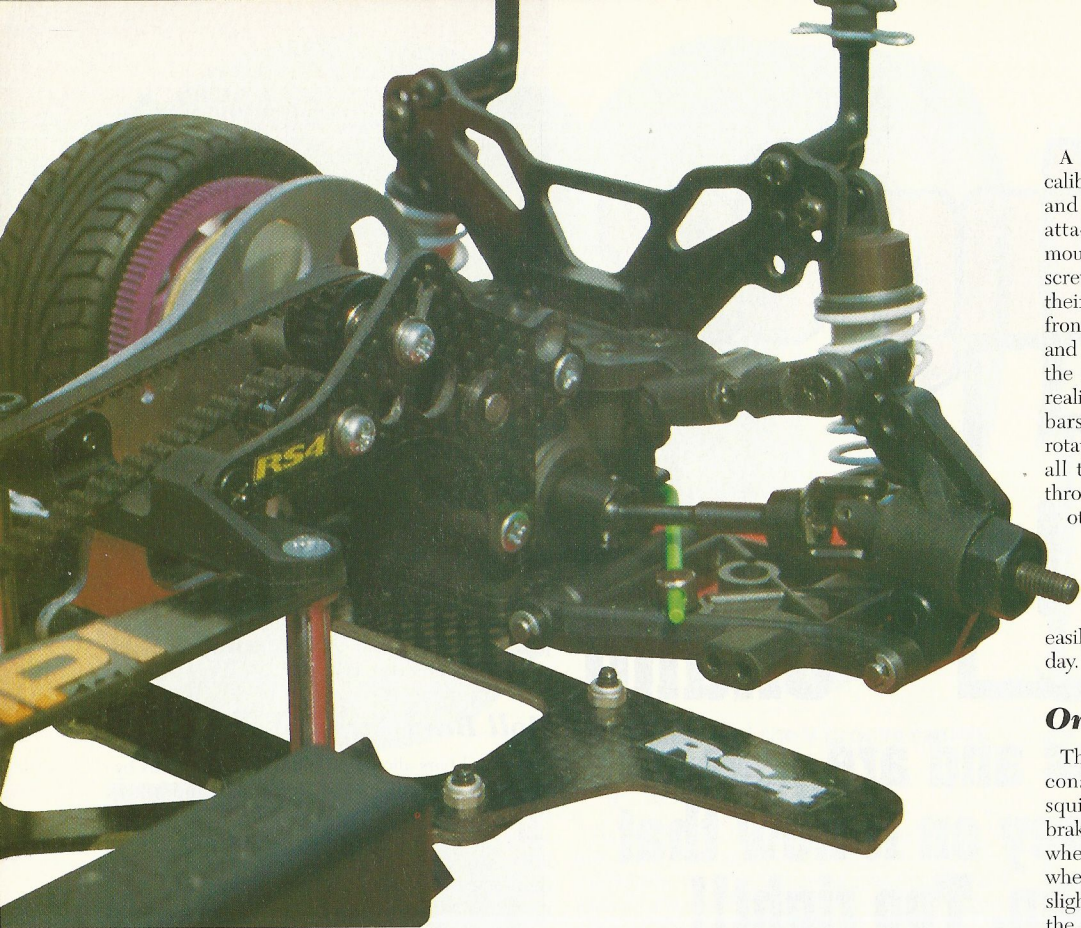


Take one RS4 and a few H.P.I. parts.

Stripped down and ready for surgery.



The rear shock mount gives three alternatives for shock position.



The re-assembled rear suspension assembly. The carbon rear shock mount and nerf wing are fitted. Note the locating boss for the anti-roll bar in the bottom wishbone.

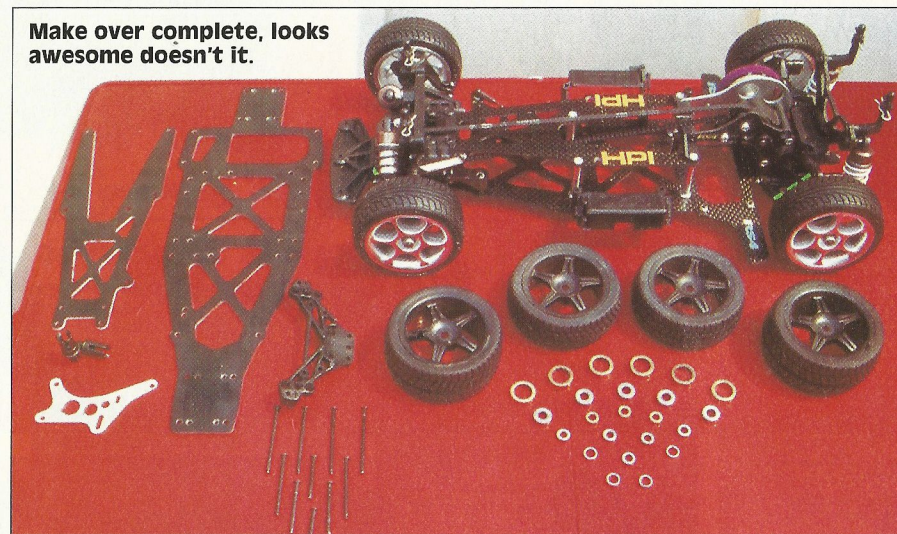
resistance of the car as a whole will reduce grip and prevent grip rolling, whilst softening the front and rear simultaneously will increase grip for a damp or dusty circuit at the start of a race meeting.

A kit of six anti-roll bars (two of each calibration; hard, medium and soft because front and rear are identical shapes) comes with the attaching ball joints that snap snugly into the moulded seats set into all four lower arms and the screws that will trap the rear anti-roll bar under their heads into the gearbox location groove. The front "Sway-Bar" locates between the diff housing and the lower arm pivot plate in a gap included in the design from conception that you never even realised is there until you come to fit the anti-roll bars. Once snapped home, the ball mountings rotate freely, tilting in any direction to account for all the twisting and turning that the bars go through when one arm tries to move without the other, and yet the bar end is free to slide in and out of the ball to cope with the effective changes in length as both arms move together over bumps. Altogether a beautifully thought out installation that is easily updated as the grip changes throughout the day.

One Way Only

The trend in scale touring cars is to keep it in constant four wheel drive on short point and squirt tracks that need as much finesse on the brakes as it does on the throttle. On longer tracks where top speed is the critical factor the front wheels can hinder the process by lagging behind slightly so a roll over front diff is required to free the ultimate top speed available from your motor. The RS4 front diff needs all its balls popping out of the belt pulley and an aluminium housing screw through three of the holes. This accommodates the neat little one way needle roller bearing that will allow either side output

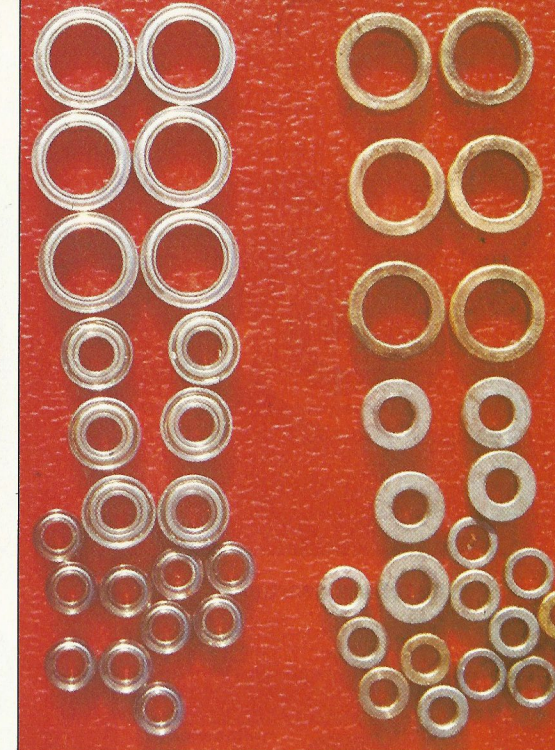
Make over complete, looks awesome doesn't it.



shaft to travel faster than the other, a novel roll over method, whilst maintaining that should the rear wheels ever lose bite, even for an instant, that there is no delay getting the front wheels back to work.

The lower suspension arms are sturdy looking items of a rugged material but to give them just that little more confidence HPI do a "NERF WING" set that screws to the main chassis plate just in front of each rear wheel to take the pain out of any close encounters. You may have seen something similar on most of the top spec Pro Ten cars about, so if its good enough for these guys then surely its good enough for the RS4.

One-way Front drive unit.

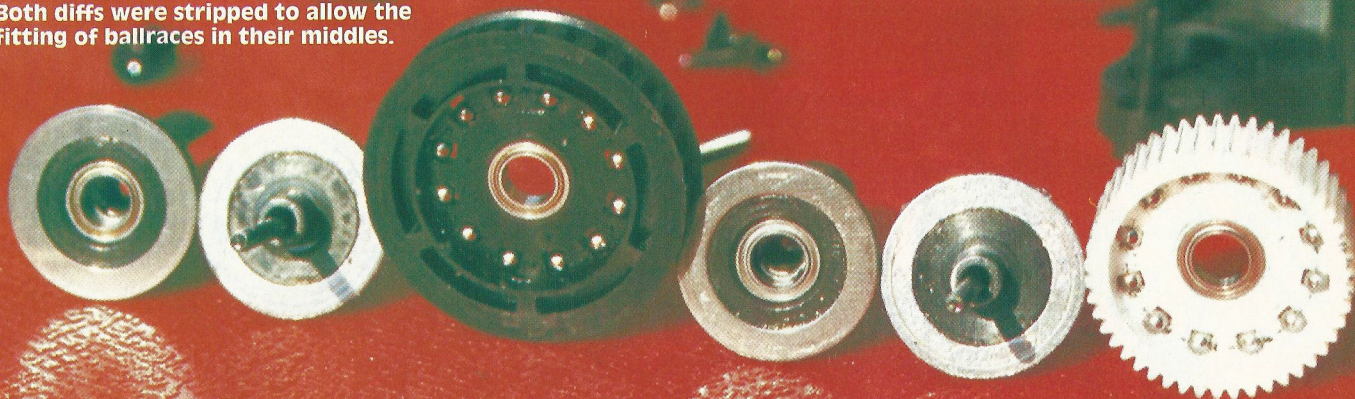


Top of the list, a ball race set.

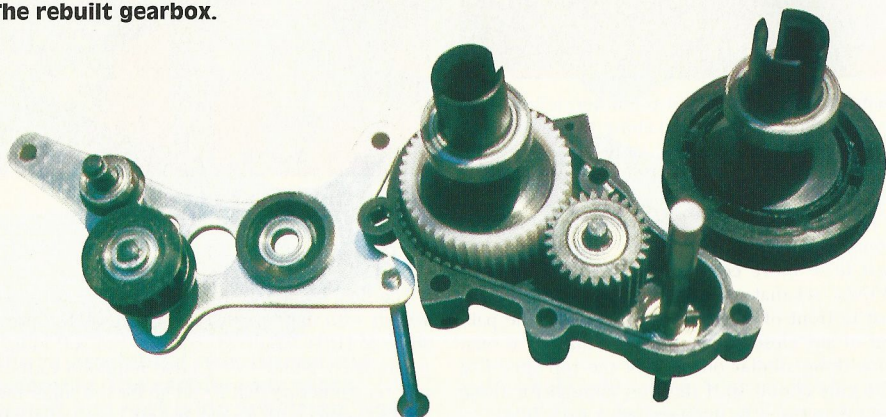
6 Spoke Class

The final touch has to be some classy six spoke wheels with that luscious chrome finish to mount some of HPI's fabulously sticky, super soft radials or similarly goopy "V" groove moulded radials, just remembering that if you go for the super low profile versions that your overall gear ratio will drop so you will have to gear a little higher with these booties on.

Both diffs were stripped to allow the fitting of ballraces in their middles.



The rebuilt gearbox.



Down to the bare bones

With all your selected improvements sat next to your car on the bench, I wouldn't start until you are sure that you have purchased all that you want from HPT's comprehensive list, as I have mentioned but a few, but once you are sure you should be down to the bare bones in less than half an hour, I promise. From here it's all up hill, the only sticking point may be the roll pins used to key the drive pulleys to the layshaft and the similar pins through the stub axles under the drive hex's. These are best removed carefully as you will want to re-use them all, so using side cutters and only gentle pressure they will yield to your desire better than having to use quite a high clamping force if you were to try the same job with point nosed pliers.

On inspection I could find no wear evident from the bushings installed initially, a tribute to the generous lubrication supplied when I firstly assembled the kit, but I did find a small piece of grit stuck in the teeth of the front belt pulley that would have eventually eaten the belt alive. This is a common problem for belt driven cars because they can never seal the front diff housing against the trackside left overs, so they leave them fully open for easier viewing of the pulleys teeth and

hope that you take the trouble to inspect them for contaminates on a regular basis.

It sure beats replacing belts

Within another half hour I had the completed car sat in front of me again but it was a completely different beast. Putting the car back together with better components took no longer than using the original equipment, but if I had upgraded the RS4 gradually with all these bits it would have taken several strip downs. So it is well worth saving up to do the job properly in the first place rather than piece mealing it together.

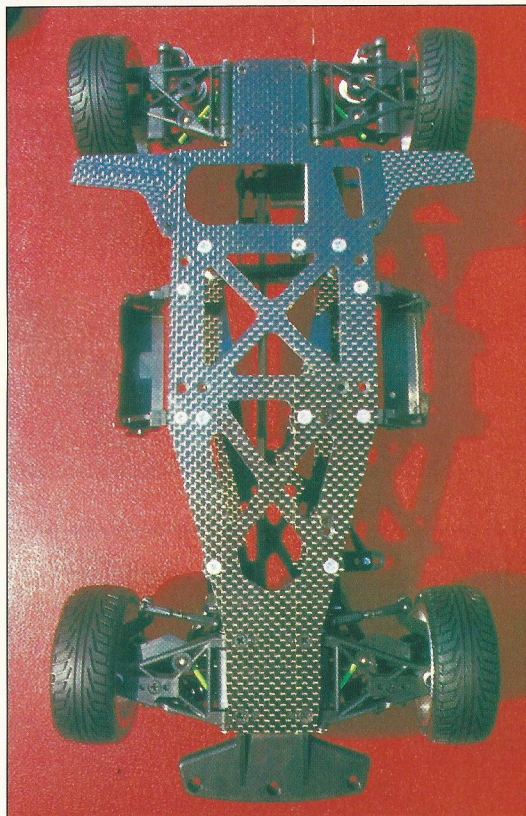
The overall weight was lower than standard even though I had added the roll bars, nerf wings and roll over front diff so you will still need a little bit of lead I'm afraid, but you have plenty of places to hide it that can help you shift the front to rear balance. The standard weight and distribution with no body, wheels or electric's was 575 grammes split 267-308g front to rear, but that was all changed now with the new assembly to 560 grammes split 262-298 front to rear.

Time for a re-run

With all the gear in and wired up ready for action the first re-run shake-down showed only the changes to the chassis as I had not changed the shocks or springs from the first run. The shocks were top spec as standard so "if it ain't broke don't fix it" came into play somewhat. The front roll over and anti-roll bars, medium all round for starters, had increased steering response turning into a corner and stability under braking while the overall amount of braking power was reduced as only the rear wheels were aiding the cars deceleration.

The straight line stability was also much

The front and rear anti-roll bars fitted to their respective gearbox casings.



All the carbon parts are of very high quality.

improved, which for a car that turned in this eagerly was a pleasant surprise. By virtue of the fact that all the stub axles were now held by ballraces the wheels maintained their castor and camber settings exactly whereas before the tiny amount of clearance required for a free running bushing would allow the settings to wander a little mid corner upsetting the ride.

All these hop up options and more are available from GM Racing, so what are you waiting for, Christmas?

OPTIONS FITTED

Ball Race Set

A 231	Carbon Main Chassis Plate
A234	Carbon Upper Deck
A218	Carbon Rear Shock Mount
A252	Carbon Gearbox Plate
A216	Carbon Nerf Wing
A505	Front One-Way Diff
A209	Sway Bar Set
4520	Low Profile Super Radials
3622	6 Spoke Chrome Wheels