

BOOSTING THE IMAGE

Looks aren't everything as Geoff Driver found out when exploring Kyosho's 'Turbo' version of the all-conquering 'Optima'

There can be no denying the success of the Kyosho 'Optima' both in sales and on the track. I venture to suggest it is probably the most successful 4x4 Off-Road car yet. Kyosho themselves are pretty proud of the car as they recently announced that they had sold 100,000 kits worldwide, and to celebrate that fact they released a 'gold' anodised chassis set.

Perhaps more significant for the dedicated 1/10th racer is an 'Optima' upgrade titled the 'Turbo Optima'. At a price of approximately £200 it is also not cheap.

Firstly the differences between the standard 'Optima' and the 'Turbo'. The most striking change is of course the new body. I personally like this body. Along with its aerodynamic looks, it incorporates a small wing to give a little down force (if you think it necessary, and protects the electrics quite well).

Underneath the shell we get down to the nitty gritty. A superficial glance reveals nothing too obvious, but initial looks can be deceiving.

Firstly the engine room. The motor supplied with the kit is a Kyosho '240S'. This adjustable timing, ballraced motor with a single 19 wind puts the kit straight into the BRCA modified class. Not only that, the '240' designation is the Japanese way of rating a motor. Namely '240' equals 240 seconds race time, or if you prefer 4 minutes. That of course is 4 minutes on a Japanese or US dirt track, not a British grass track.

The kit is supplied with a steel 9 tooth motor pinion which drives on to an intermediate reduction gear, supported on ballraces (this gives a low overall ratio of 13.8:1).

Ballraces are a common theme throughout this kit as it comes complete with sixteen of them, unlike the standard 'Optima' where 12 ballraces must be bought separately.

The intermediate gear drives the gearbox main input gear. This gear incorporates what Kyosho would probably choose to call a torque limiter, in my somewhat simplistic way I would call it a pre-set slipping clutch. The purpose of this is to guard against dramatic and sudden transmission shocks. If the car is airborne the reduced load will allow the motor to rev very high and upon landing there will be some very high loads imposed on the transmission. Without some form of transmission cushion the weakest point will give. In the past the weakest points have included the chains or differentials.

The 'load limiting clutch' (my description, not Kyosho's) will slip and absorb the shock. That's the idea. The mechanics of this device are very simple, being nothing more than a coil spring that forces two washers apart, one against the gearbox drive gear and the other against a flange on the input drive-shaft. It is, I suppose the transmission engineers answer to the servo-saver.

Of course, setting this clutch too loose and you will certainly protect the transmission, but you will also lose out on acceleration. It will certainly be a matter of some experimentation to get the right setting. I suspect that the race hardened expert will adjudge the worth of this and tighten the spring as far as necessary.

The fully ballraced gearbox drives the rear wheels through a conventional two pinion differential and the drive to the front wheels is by the usual Kyosho ladder chain. Ripmax, the UK importer for the cars tell us the chain is heavy-duty. Kyosho make no great play of this. I understand that the drive chain has been upgraded on all 'Optima' models to the new thicker link type and so it is not a special feature as far as the makers are concerned.

Twin aluminium rails provide the main chassis construction supporting the drive gearbox at the rear and differential gearbox at the front.

The addition of a pressed aluminium under-guard fills in all the spaces between the two chassis rails further protecting the chain and helping to keep out unwanted foliage.

The suspension has come in for some detailed work, although the basic geometry remains the same. As with the standard 'Optima' the inboard top rear arm fixing position can be changed to induce more negative camber as the wheel rises and hence more rear-end grip on cornering. In addition the length of all four top arms can be adjusted which also affect the cornering characteristics.

The suspension lower arms have been strengthened by including some webbing across the wishbones. New alternative damper positions have also been provided on the rear lower wishbones. These three new positions each give different amounts of suspension travel.

The dampers themselves are quite new and should be available as an add-on goody to fit existing 'Optimas' under the 'Option House' banner. Remember though it is not just a matter of buying the new dampers. You will need to buy the new support brackets to go with them.

The anodised gold body of the damper might look a little like some well known American units but that is as far as the similarity goes. The dampers are really quite different and incorporate volume compensating diaphragms to take care of the changes in internal volume as the piston moves up and down.

There are in addition a range of pistons allowing three different damping rates. Together with the spring adjustments and use of different grade oils you can spend a complete race day experimenting to find a satisfactory suspension set-up.

The other main suspension change is the addition of anti-roll bars at the front and rear of the car.

Wheels and tyres are of the new low profile style in common with a number of other kit makers. Kyosho have decided to stick with the taper drive on the drive-shaft as they have on just about all their other 1/10th cars. The drive onto the wheel itself is by a hexagon stub fitting into a hexagon socket on the wheel. Wheels are in two parts held together by four screws.

The tyres supplied with the kit are pin spike in design and moulded in a fairly hard compound. I have checked the fit of most other low profile tyres currently available and they fit this wheel, which must be good news. Kyosho themselves are making available two alternative tread patterns with small blocks in place of the spikes.

There is one striking change about this kit that fills me with trepidation. The message printed on the outside of the box is that the 'Optima Turbo' is the first production racer designed for 8.4 volts as well as 7.2 volts. This move to 8.4 volts is not unique to Kyosho as I notice that Tamiya are also saying that the latest 'BigWig' is suitable for 8.4 volts. Both these companies are now producing battery packs and chargers for this voltage.

There can be little doubt that the cars will go faster with this higher voltage, but I suspect the makers are providing for the US market (the highest importer of Japanese kits) and perhaps trying to stimulate a new demand for some sort of Super 1/10th racing.

My own very personal view is that this is not a good move. Indeed the BRCA managed to move away from 7 cell (8.4 volt) racing not so long ago.



TURBO OPTIMA

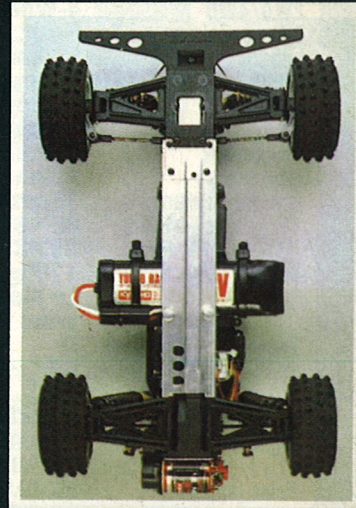
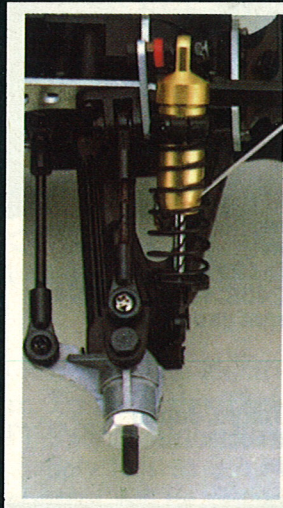
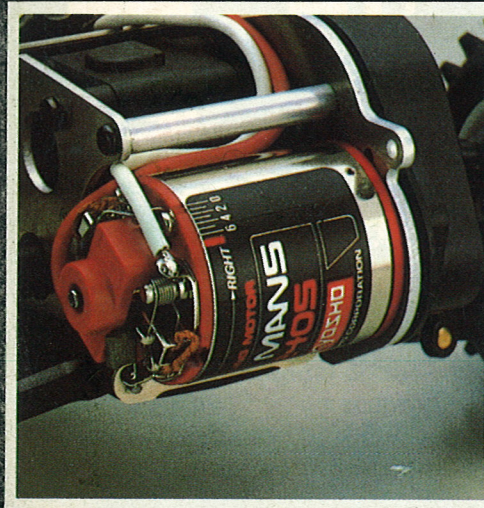
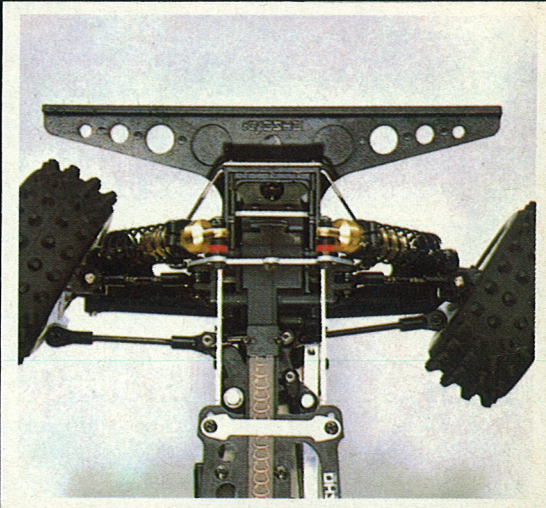
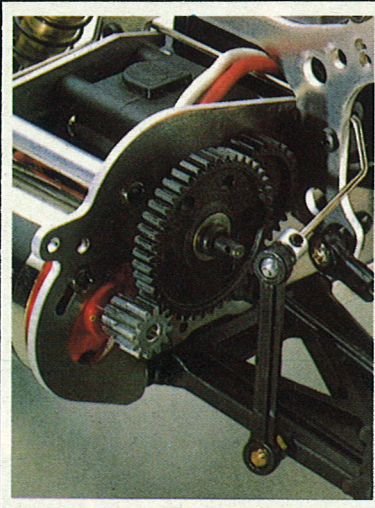
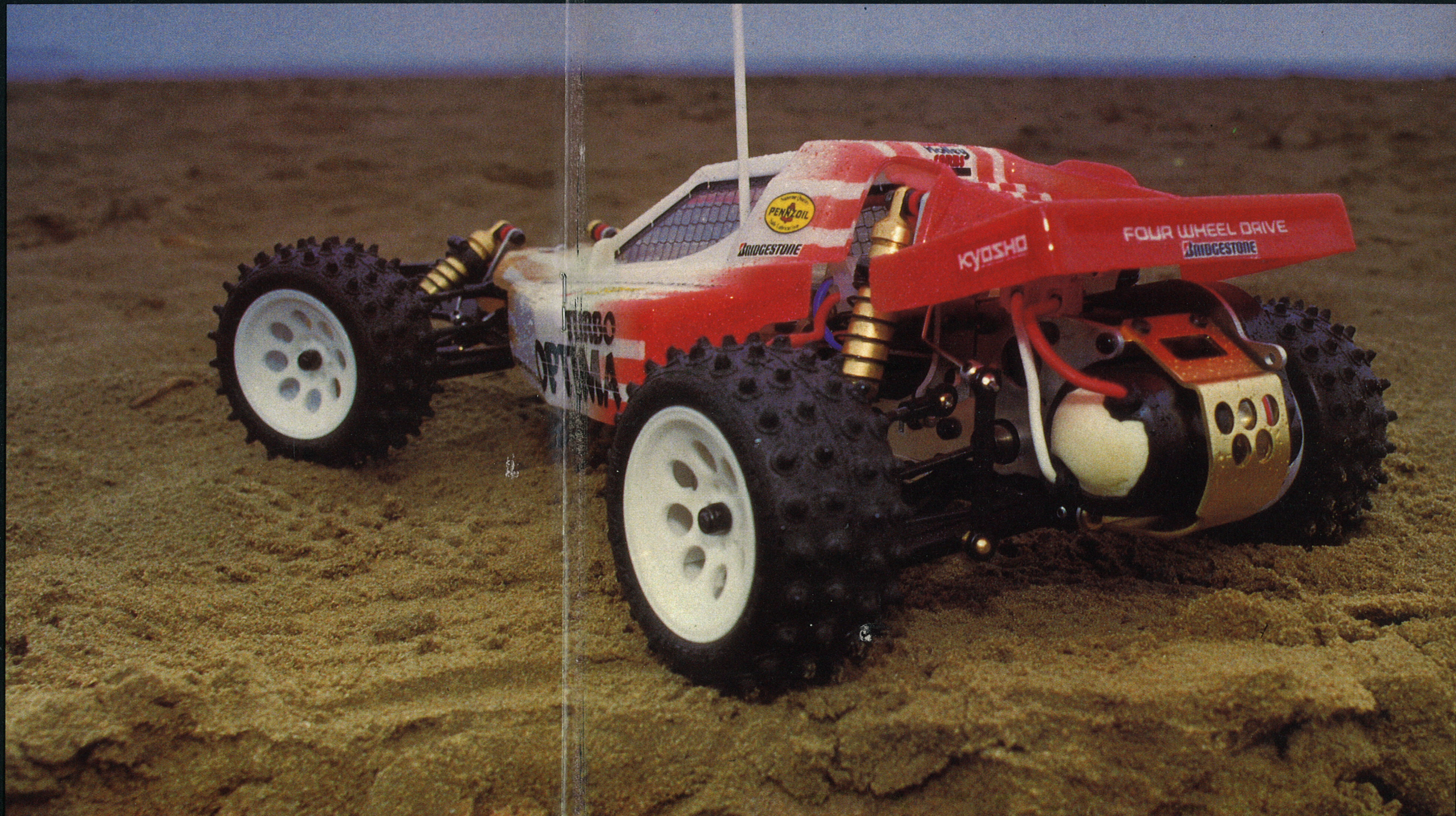
4WD OFF-ROAD RACER

Attention to detail is the hallmark of this Turbo version of the 'Optima.' The race-proven transmission has been further strengthened with a heavier duty chain plus a torque limiter to lessen transmission shocks through the gearbox.

Adjustable anti-roll bars now feature front and rear to allow further fine tuning of the car's handling.

New, volume compensating dampers regulate the suspension movement from a variety of mounting positions. The suspension wishbones have been strengthened and feature a choice of damper fixings.

Keeping the chain and chassis section free from dirt is afforded by the alloy chassis underplate. Finally Kyosho's Le Mans 240S motor provides the power.



BOOSTING THE IMAGE

Continued from page 35

My reasons for objecting to this move are really financial. You will need new batteries, new charger, possibly a new speed controller, the risk of breakage is increased and lastly I had a hard enough time controlling a 7.2v 'Turbo Optima' let alone anything faster.

As far as the 'Optima Turbo' is concerned I cannot find anything on the car that makes it specifically an 8.4v racer other than a particularly wide body to allow the additional cell somewhere to go.

Building Notes

This will provide no problem for the experienced 1/10th enthusiast, but it must be remembered that although this is very much a car for the serious racer, their will be first-time buyers putting these kits together. I would remind them that they are putting together a well engineered, fairly complicated mechanism. There is the temptation to rush on and get to the hills, but be wise. Do not rush the construction, the more you know about how the car goes together the easier it will be to maintain when the time comes.

The kit is very complete. All oils and thread locking compounds are included, the instructions have excellent diagrams, I used the Japanese instructions and just followed the pictures (it was that easy).

Up and running

The 'Optima' has built its reputation for handling and performance in the world of model racing. The list of successes at club, national and international events bears

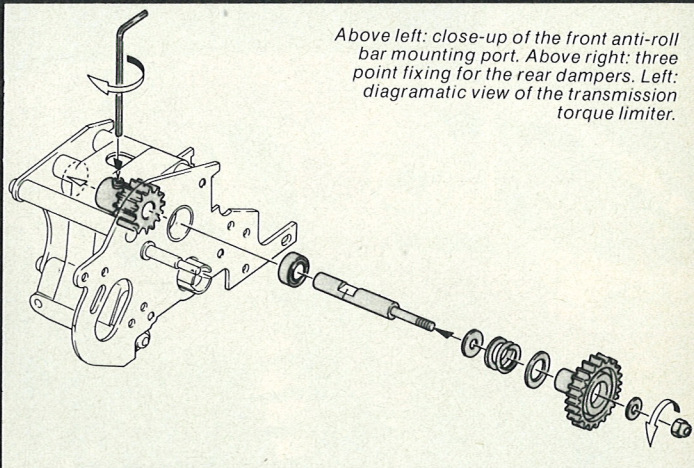
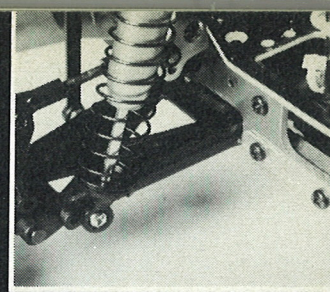
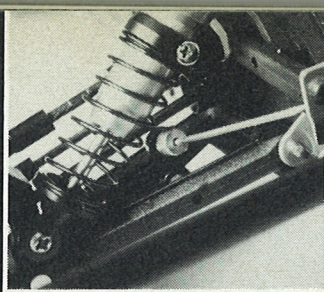
witness to this. The 'Optimas' that have won at these events have included some detailed changes, perhaps the most significant being changes of damper units. It seems to me that *Kyosho* recognised this and produced the version fitted to the 'Turbo Optima'. I think that these are a worthwhile change.

I noticed that many drivers who fitted alternative dampers to the original 'Optimas' made up new brackets that had the front dampers almost vertical. It seems to me that although perhaps not so elegant the more upright mounting gives better damping action. This would have been an ideal opportunity for *Kyosho* to change the front brackets completely. However *Kyosho* either thought that the front suspension is quite adequate or looks are more important to them.

I am not so convinced about the necessity of the torque limiter. I found it either too loose or completely ineffective, so it is now tightened right down pending further experiment.

As far as car handling is concerned, I can detect virtually no difference between the original 'Optima' and this upgrade version, but this is not very surprising as the geometry of steering and suspension is the same. I must say I expected something a little more impressive from the motor, and although it was fast, it did not have the zing that I would expect from a fairly hot wind. However the makers did provide a neat cover to go over the brush gear with a foam insert to at least allow some air to circulate.

At the drive end of the motor



Above left: close-up of the front anti-roll bar mounting port. Above right: three point fixing for the rear dampers. Left: diagrammatic view of the transmission torque limiter.

you can fit a small spacer plate (provided in the kit) which is intended to allow a gap for cooling air to enter the motor through the holes in the end cap. The problem with this is that the plate virtually covers all the holes in the end cap so the whole exercise seems a waste of effort.

When an 'Optima' is hit from behind the motor may either be damaged or shifted forward forcing the motor pinion into too tight a mesh with the plastic intermediate gear. Although this can be avoided by fitting *Kyosho's* rear guard, although unfortunately this invaluable item was not included in the kit.

The strengthening of suspension and transmission parts is to be welcomed as I have seen a few broken 'Optima' limbs lying around the tracks. However I cannot vouch for the strength of the new arms as that would involve an act of wanton destruction on a brand new car.

The addition of the anti-roll bar seemed an unnecessary addition and the type that *Kyosho* have fitted to the 'Turbo' appear to have a very minimal effect. I personally thought the original car was OK without A/Roll bars and still do.

Conclusions

In producing this upgrade version of the 'Optima', *Kyosho* have included changes that have been learnt from the hard experience of racing. Most of the changes are worthwhile and are not simply cosmetic. The introduction of the torque limiting device I find questionable, but that is minor with so many other useful improvements. What is particularly useful is that most of the improvements should be available, allowing existing 'Optima' owners to bring their own cars up to the higher specification.

Specification Check

Car Type	Turbo Optima
	1/10th Scale Off-Road
	4-wheel drive
Differentials	2
Length	390mm
Width	240mm
Height	125mm
Wheelbase	260mm
Front track	200mm
Rear track	202mm
Ground clearance	35mm
Tyre sizes — Front	85 x 37mm
Rear	85 x 37mm
Weight	1700g (3lb 12oz)
Motor	Le Mans 240S, 19 turn single wind - .9mm gauge wire
Bearings — Plain	0
Ballrace	16
Total	16
Manufacturer	Kyosho, Tokyo, Japan
Importer	Ripmax Models, Enfield, Middlesex
Price (approx.)	£200.00

