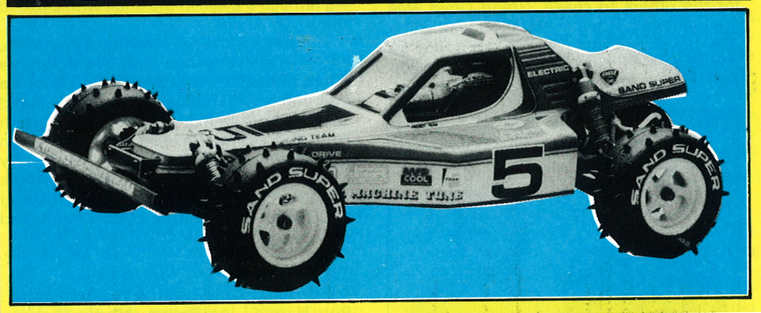
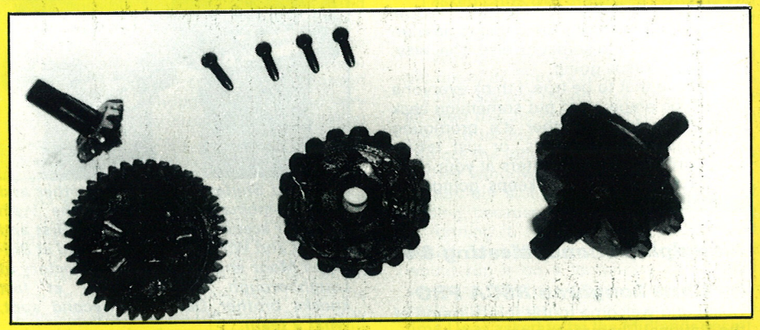
4WD OFF-ROAD RACER OPTIMA

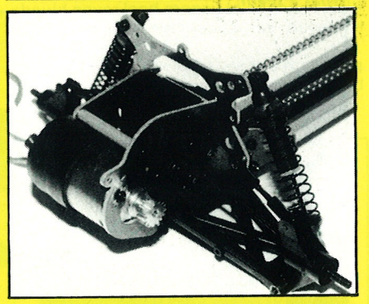


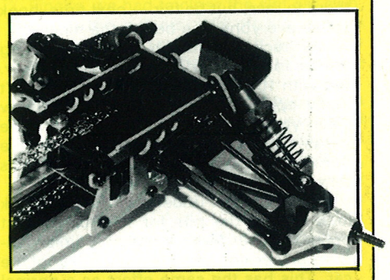
Optima, Kyosho's latest release, breaks away from previous design technology by abandoning the concept of four wheel steering and concentrating upon perfecting the mechanics of four wheel drive. Bred for competition, the Optima is designed as a winner from the ground up. However, anyone thinking that they can pick up an Optima on a Friday night and be racing and winning on Saturday afternoon should think again, for this is a kit and this article will partly be a construction review. Before we get too involved with the construction let's get through a few technicalities. The length of the car is 15.9ins., wheel base is 10.6ins. and overall track is 7.7ins. The designed weight is 55ozs, for those of you in metric 1550 grams, and the gear ratio supplied as standard in the kit are 8.28 to 1 or 10.35 to 1. The Optima kit includes a Mabuchi RS540S and it also includes a mechanical speed controller but a battery pack is not included nor, of course, is a radio system. You will not need a fantastic number of tools, a Phillips screwdriver is essential as are a couple of pliers and a sharp craft knife. The latter will be required to clean up many of the moulded parts which are still attached to the sprue. Liquid threadlock, silicone grease and Allen keys are included in the kit.

Construction starts with the disassembly and filling of the four adjustable-spring oil filled suspension units. This is quite a simple process and it reveals that the pistons have an unusual groove running around their circumference. This may well be to improve the mixing of the oil with the necessary air bubble within the damper. An indication of how complete this set is, is revealed by the inclusion of a small wrench which engages neatly with the end cap of the damper. The wheels are assembled next, these have semi-pneumatic tyres and a three-piece hub. The hubs are moulded from white nylon-like material and have an attractive design and the specifications of these units, for those of you who would like to change the tyres, is 47 by 30 mms. This does not mean that there is anything wrong with the tyres themselves, they are well moulded with a 2 and 2 spike arrangement and are suitably soft to grip the ground under most conditions. Next on the agenda are the two differential units for the front and rear of the car. Examination proves these to be very neatly moulded from glass filed nylon and containing a bevelled gear differential system. Looking even closer reveals that they have a very ingeniou s system whereby the rpm of the front and rear wheels in relation to each other may be adjusted. Using an 18 tooth gear on both the front and the rear results in both wheels operating at the same speed, but a 19 tooth gear may be replaced with one or the other of these so that the front wheels will either run faster or slower than the rear. The demanding driver can then ensure that the car will either under-



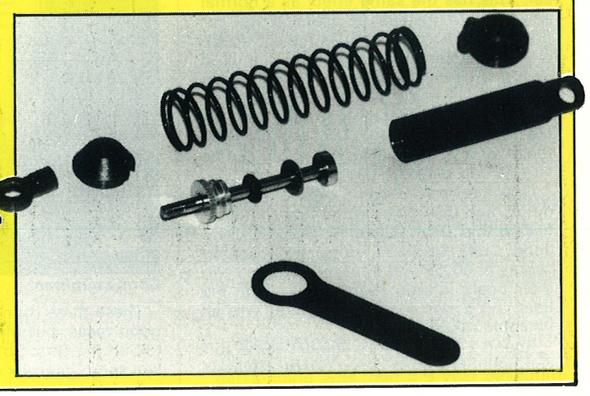
Above, the differentials. The one on the right is the front one with 18 or 19 tooth gears. Left, rear suspension showing the gear drive.

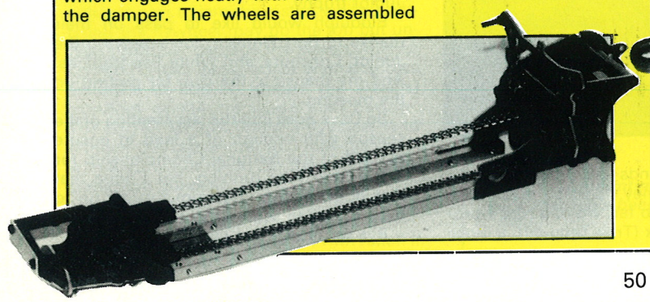




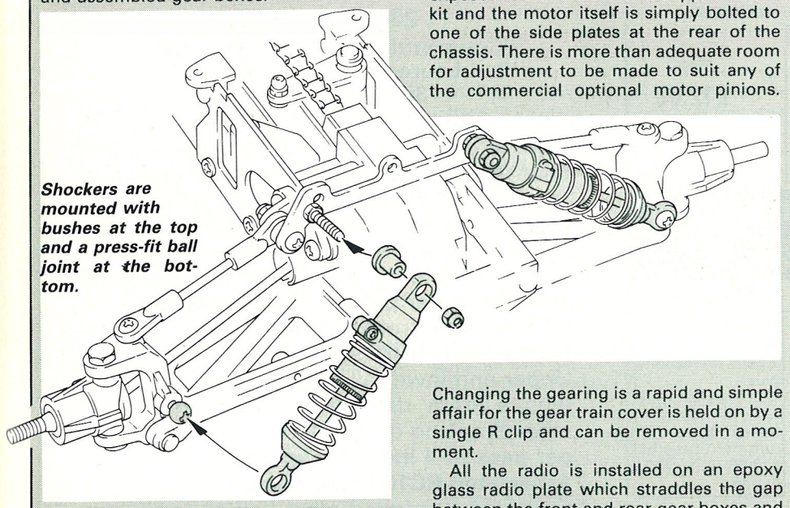
Right, the front end. The Lexan-topped protective channel for the drive chain can be seen.

Right, a suspension unit disassembled for filling. Below, the basic chassis.





steer or oversteer according to his own particular requirements, however he has to make his mind up early in the construction which he requires for it is a lengthy job to dismantle the car to get back to the differentials once they are within the installed and assembled gear boxes.



Shockers are mounted with bushes at the top and a press-fit ball joint at the bottom.

It is at this stage that the construction really takes off. The rear is assembled first with the glass filled nylon gear box being assembled, then wrapped up with the necessary punched alloy plates. The front gear box of similar materials is then assembled and then the two are connected rigidly with two substantial square section alloy longerons. One has to stay awake during this procedure otherwise there is a distinct chance of tieing the transmission chain up in knots as you attempt to avoid a cats cradle of longerons and chain. At this time one of the more thoughtful points of the car appears in the form of a moulded channel to keep the dust and dirt away from the chain. This channel is fitted with a Lexan top cover which allows the user to keep an eye on the condition of the chain. When the car is finished the chain is completely protected.

The steering set-up is of the true Ackermann type with a servo saving bell crank on the left hand side of the car and a slave arm on the right hand side, the two being connected by a rigid tie rod. Bump steer is non-existant.

The suspension arrangements to the front and rear of the car are essentially similar, a single glass filled nylon wishbone below the upright and at the top a ball-joint-equipped tie rod. Considerable care has gone into the engineering of the car to make sure that there is no tightening up of the drive rods as the suspension works. Further intriguing points appear at this stage of the construction. The ride height at both the front and the rear of the car may be adjusted by repositioning the upper end of the suspension units. Similarly provision is also made for the fitting of an anti-roll bar to both front and rear, though these parts are not supplied in the kit. Now comes one disappointing part of the Optima and that is that the hubs are only supplied with nylon bearings, a disappointment as this race bred car deserves better than this, though the manufacturer is probably taking the purchasers initial payments into account. Fortunately the bearings are of a standard size (5mm ID, 10mm OD) and the enthusiastic racer will only have to fit eight. Further bearings are optional if the gear train is to be ball raced.

The motor is fitted surprisingly late in the construction. A rubber boot to protect the exposed rear of the motor is supplied in the kit and the motor itself is simply bolted to one of the side plates at the rear of the chassis. There is more than adequate room for adjustment to be made to suit any of the commercial optional motor pinions.

Changing the gearing is a rapid and simple affair for the gear train cover is held on by a single R clip and can be removed in a moment.

All the radio is installed on an epoxy glass radio plate which straddles the gap between the front and rear gear boxes and forms an integral part of the chassis. Servos are retained in place by a combination of servo tape and tie wraps, and the receiver is servo taped on top of the shaker plate and is comfortably concealed by the smoked Lexan driver figure. The mechanical speed controller has to be built up from separate components and when completed gives the driver a choice of three forward speeds, neutral, a set brake and a single reverse speed. When installed the speed controller is also protected by the driver figure. The speed control servo is mounted upright to the rear of the radio plate, while the steering servo is mounted on the underside of the plate and, naturally, at the front. Between the two servos is mounted the transverse six cell battery pack, an unusual location but this does give the car a 50-50 weight distribution, required for an effective four wheel drive performance. The main battery pack is held in place by unlockable tie straps, a situation that would not recommend the Optima to endurance racing as it takes too long to change the main pack. The final stage in the construction of the chassis is the fitting of the wheels. This presents the only difficulty of the construction, for the wheels fit on hexagonal drivers that are attached to the axles simply by a taper. The result of this is that you have nothing to work against when trying to tighten the single nylon nut that retains the hub. An outsider might be amused by the sight of an individual trying to tighten one wheel on the car while the other three go round as he moves the spanner, but the spanner wielder may not sympathise with their amusement.

Finally, we are left with the cosmetic work of decorating the car using the moulded Lexan body shell. This is one of the more attractive types that we have seen having the single seat Californian Desert racer styling that used to be so familiar on Rough Riders and similar. The body shell has a quick release fastening of an R clip front and rear. Total construction time was some 11 hours and, speaking as a modeller who likes building things, it was a thoroughly enjoyable exercise.

Assessment

We have got thus far, what have we ended up with? Optima lives up to her name, for there is plenty of opportunity to dial this car in to produce the optimum performance for a given track. As already indicated, the right height of the car can be adjusted which will allow the car to be dialled into either a fast or a rough track. The spring tension on the coil over shock units may be adjusted to suit the driver's preference and further adjustments may be made to the camber of the wheels, not just at rest but on the rear, as the suspension works through its full range of movement. A sheet that accompanies the instructions graphically illustrates the way in which all these adjustments may be made and also the benefits that can be reaped from them. There is also plenty of opportunity for changes and additions to be made to the Optima to improve its performance even further. As already mentioned provision is made for anti-roll bars to be installed at both front and rear and the addition of ball races to the hubs and one or two of the gear shafts within the rear gear box would also be a benefit. So much for the words, now it's time to take the car out onto the track and see what she can really do.

Kyosho's Optima is distributed by Ripmax Models, Green Street, Enfield, Middx. See adverts for price.

Ready to roll, less nicads and bodyshell.