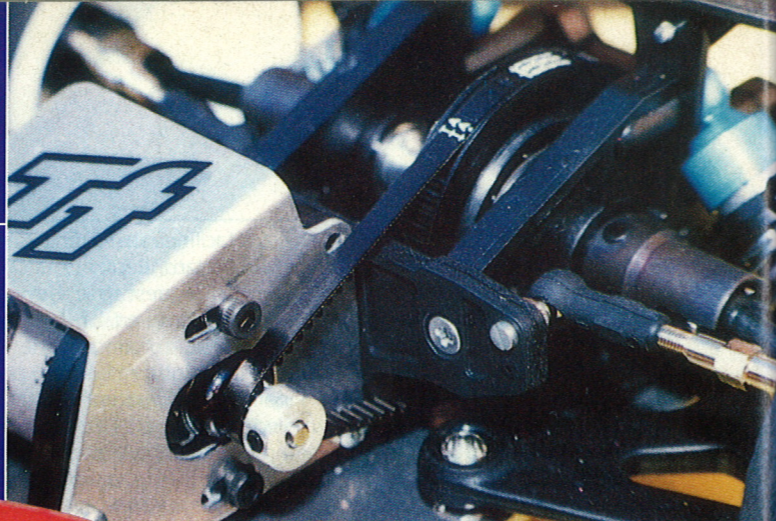


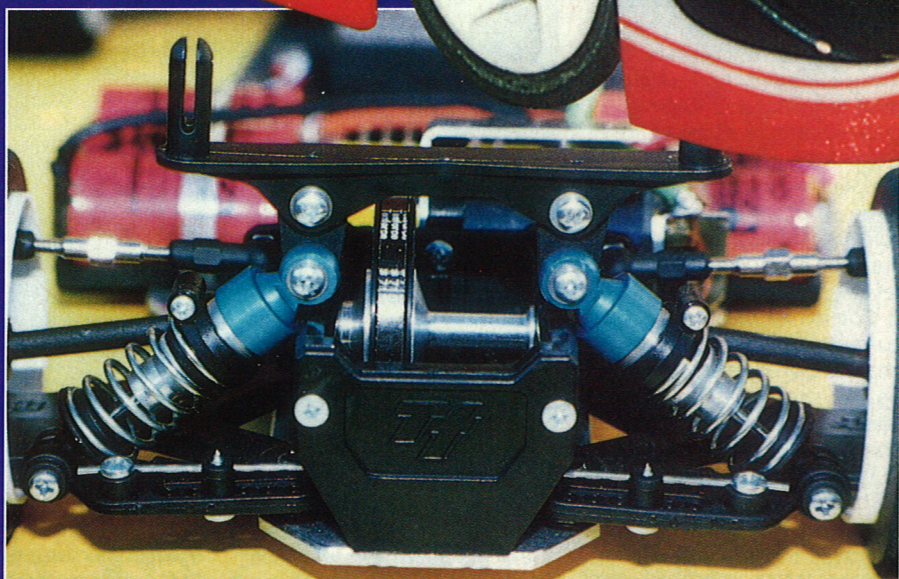
**Is independent suspension
the way to go for Pro Ten?
RRC investigates.**



○ The belt drive system is very smooth and efficient.



○ The all-important independent rear suspension. Is this the way to go for Pro Ten?



BERTON
TF

TENFORCE

Pro Ten racing is just about to enter its third year as a competitive section of R/C car racing in the U.K. It is very sad that it hasn't received the enthusiasm from R/C racers that it deserves, because it really is one of the most enjoyable and exciting types of model car racing.

Several reasons could be put forward as to why Pro Ten is such a minority sport, the main one being that the cars are supposedly so difficult to drive. True, they take a bit more concentration and finesse to navigate than off road buggies for example, but once driven for a couple of races one soon gets the hang of it.

Unfortunately people either don't want to or can't take the time to learn to drive these flat pan

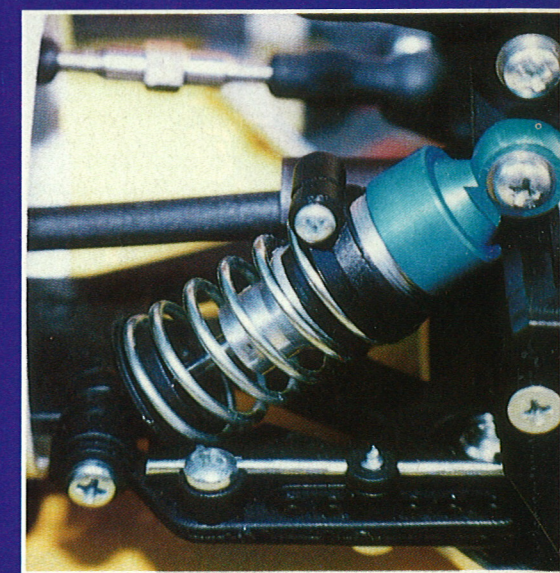
missiles, so if this section of the sport is to progress the cars must be made easier to drive. Berton, the manufacturers of the world famous Serpent 1/8 scale I.C. circuit racer, have put all of their ten years of model making knowledge into a new 1/10 scale electric powered circuit racer, the TenForce 01 FSB.

FSB

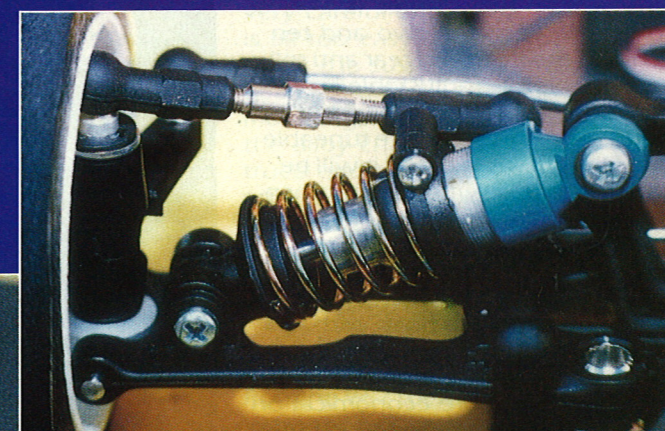
FS in the Tenforce's title stands for 'full suspension', and this is where it will find favour with many of the timid/reluctant 'would be' circuit racers. Unlike the normal Pro Ten cars that are being raced at the moment, the Tenforce car incorporates full suspension all round, ie the rear end does not have a solid axle.

Four strong, beautifully moulded nylon arms provide the base for the suspension on all four wheels. Adjustable upper arms control the

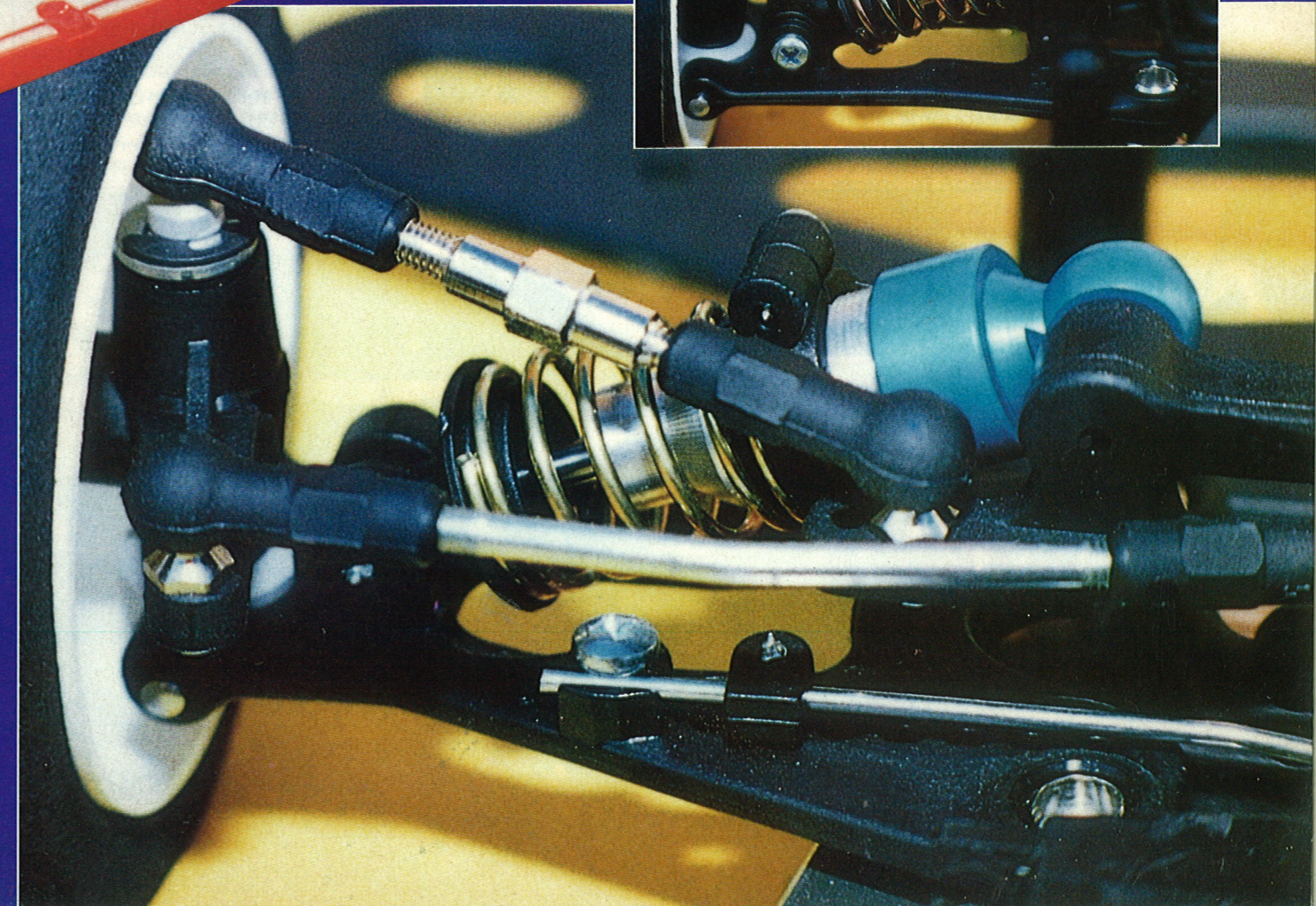
○ Rear anti-roll bar, shock absorber, driveshaft and upper suspension link can be seen here.

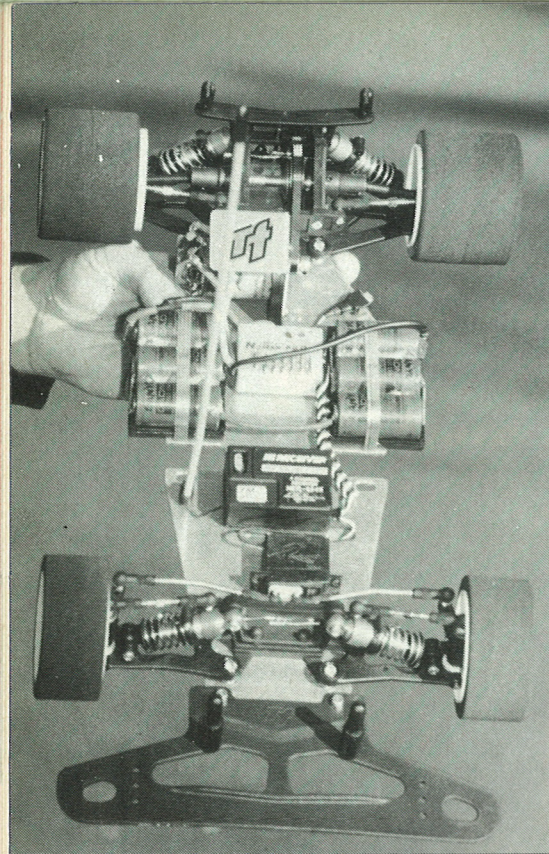


○ The shock absorbers are superb quality units.



○ Close-up detail of the front suspension.





is the system the Tenforce uses to transmit power to the rear wheels. A fine pitch (2mm) Kevlar belt gives ultra smooth drive from the aluminium motor pulley to the nylon differential pulley which houses a typical, fully adjustable ball differential.



Construction

The Tenforce is a very simple kit to build, and the instructions are clear and very concise. The presentation of the kit is equal to, if not better than some of the well known Japanese manufacturers! All of the screws, plastic mouldings, wheels and tyres are individually packaged and labelled.

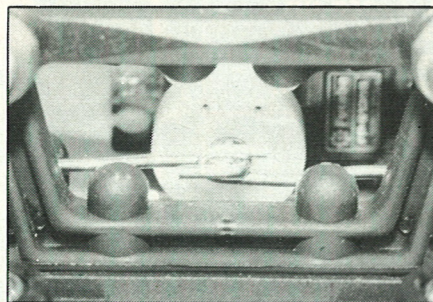
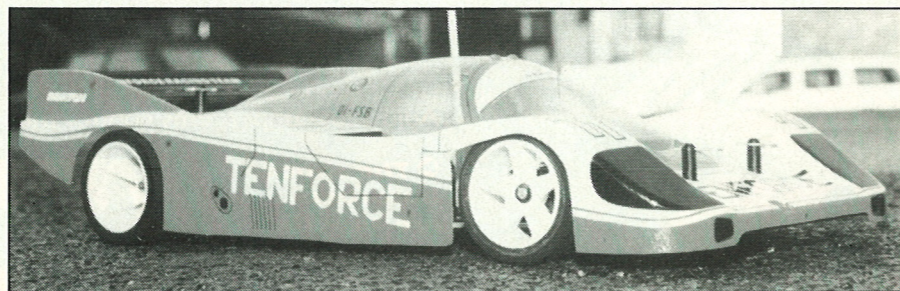
The kit also comes with a bodyshell as standard, an Andy's Porsche 962 GTP. This is unusual for 'Pro Ten' kits, and shows the care and thought that Berton have put into producing the Tenforce.

Construction begins with inserting the front axles into the front steering blocks. This should be done on a firm surface as

wheel travel and camber angle. Also the upper pivot points can be changed to alter the roll centre of the car. The caster angle is adjustable between two and ten degrees, the front and rear anti roll bars are all fully adjustable.

What this means is that the Tenforce is infinitely more tuneable than any car to date, and it will be able to generate more grip when compared to its fully floating rear ended cousins. Because it can generate grip more easily than other cars, the Tenforce should hopefully be able to do so with less expensive types of tyres. Not only will the car be much easier to drive, it will also be more economical on the all important round black bits.

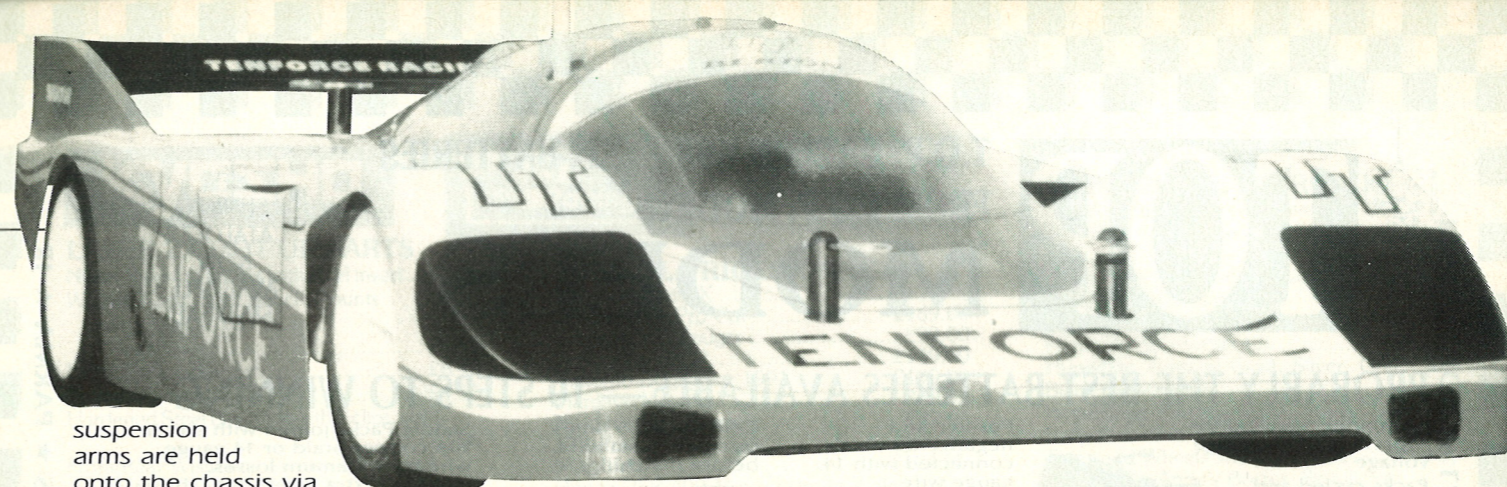
The B stands for belt drive which



◀ **The interlocking wire seen here is the centrepiece of the front anti-roll bar.**

considerable force has to be applied to seat them properly. Once in place though there is no way that they should move.

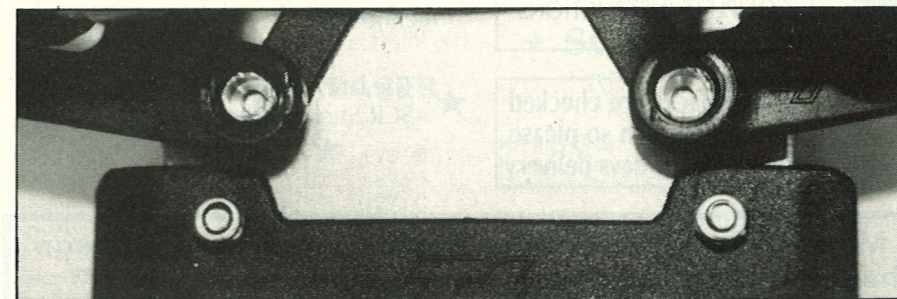
Four different caster blocks are supplied to obviously give differing amounts of caster for different road and handling conditions. The front



suspension arms are held onto the chassis via four alloy balls, which clip into holes in the arms.

The instructions tell you to put the balls on the chassis and then fix the arms on. It is much easier, however, to put the balls into the arms before securing to the chassis with a pair of pliers, as it is almost impossible to push the arms onto the balls by hand when fixed to the chassis.

Again, once in place the balls move very freely in the mouldings and should, under no circumstances, come out! The same method is used at the rear of the car to retain the larger rear arms. Again you should push the balls into the arms before attaching them



◀ **The suspension arm balls can be seen here, behind the locknuts. Insert the balls into the arms first!**

to the chassis.

Each anti roll bar (front and rear) consists of two halves, which interlock at the centrepiece of the car. Small plastic retaining mouldings hold the roll bar in place on the lower suspension arms, and can be moved in and out to induce different amounts of roll stiffness and grip. The design has been really well thought out, and is the same as that used on its larger 1/8 scale cousin the Serpent Sprint.

Another excellent design feature of the Tenforce is the oil filled shock absorbers. They can be constructed in two ways, giving totally different suspension characteristics. If they are set up the 'easy' way (as the

instructions suggest for beginners) they act like normal shock absorbers, and the stiffness can be adjusted via the springs and collets. If they are set up the 'difficult' way the damping can be adjusted externally. By simply turning the lower ball joint on the shock shaft you can effectively alter the thickness of the oil in the damper without actually taking the oil out of the chamber.

It works because the piston is in three pieces, a rubber 'O' ring is trapped between two plastic washers. When the shock shaft is screwed either in or out, the lower of the plastic washers moves towards or away from the 'O' ring, which either restricts or permits the flow of oil, thereby changing the rate at which the shock absorber damps at. So, instead of taking 20 minutes to change the oil in your shock absorbers the same effect can be achieved in about five minutes, which means more time on the track to get your car set up.

Even though the second method

of construction is slightly more complex and time consuming, it is well worth reading the instructions and building the shock absorbers this way, because you won't have to take them apart later on.

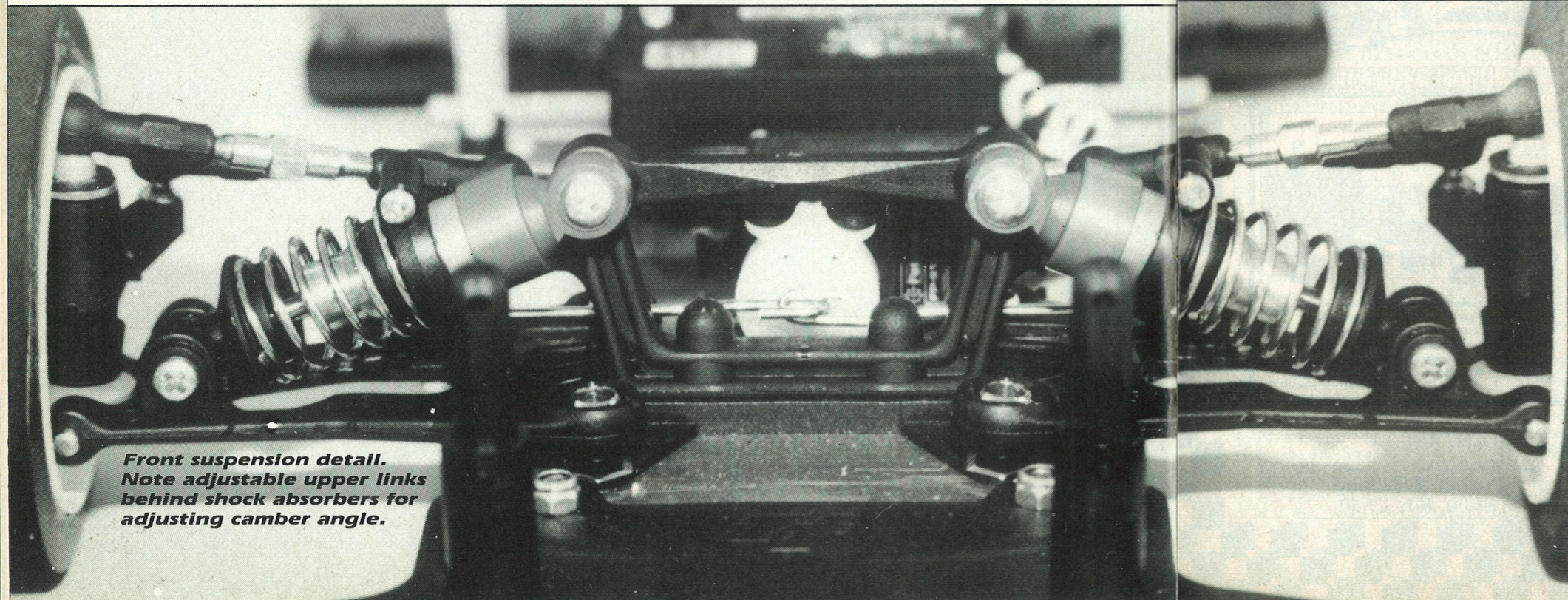
Unfortunately the shock absorbers have only one fixing point on the suspension arms and chassis, so the ride height can't be altered, which is a shame as this is quite an important feature on 'Pro Ten' cars, because tyre life can be extended greatly.

The majority of the kit is held together with alloy countersunk self tapping screws. You must be very careful with these because it is all too easy to strip the heads. Once the suspension arms, gearbox, and all other plastic mouldings have been attached to the alloy chassis, the tyres can be trued and glued to the very attractive five spoked wheels, which are ballraced. In fact the whole kit is ballraced, although this is to be expected from a kit of such quality.

Once our regular lexan body artist, John Rogers, had painted the Porsche 962 shell in suitable colours we were ready to go. A Space Age Technologies 17 x 2 modified motor, JR Apex receiver, 135S servo and electronic speed controller were fitted into the car for the initial test runs. The first thing one notices about the Tenforce is how quiet it is, because of the belt drive, which makes it seem really smooth and fast.

The Tenforce was very stable and easy to drive, considerably more so than its premier class predecessors, and as mentioned before this is where the Tenforce will become popular. Because it is easier to drive anyone can learn the subtle art of electric circuit racing very quickly, and hopefully many more people will take up this side of the sport.

The Tenforce is a superbly manufactured and designed racing model car. It is fast, strong and fun to drive. Other manufacturers will have to go a long way if they are going to beat this car in the new independent suspension class. ●



Front suspension detail. Note adjustable upper links behind shock absorbers for adjusting camber angle.