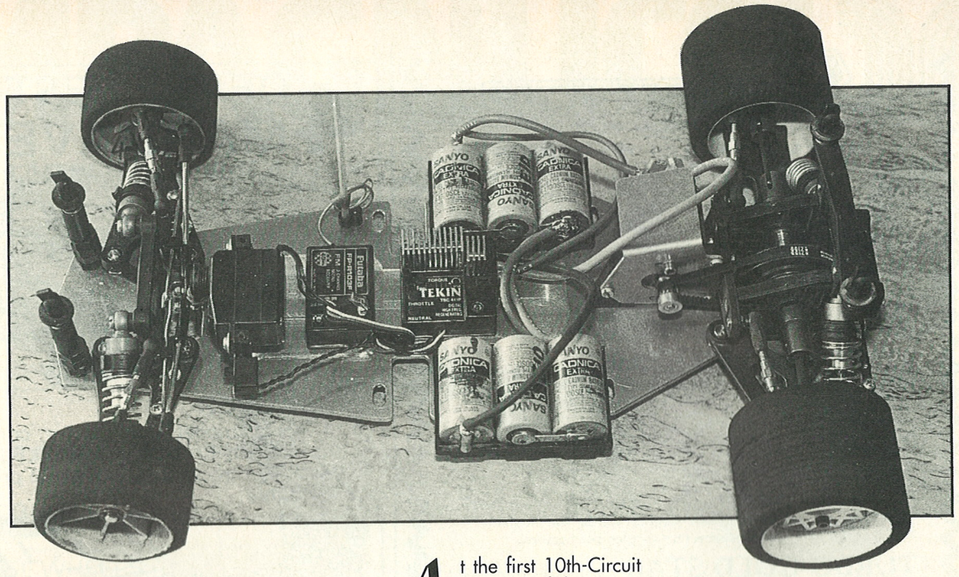
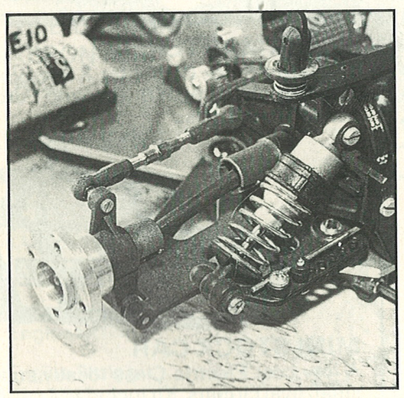
UPDATE

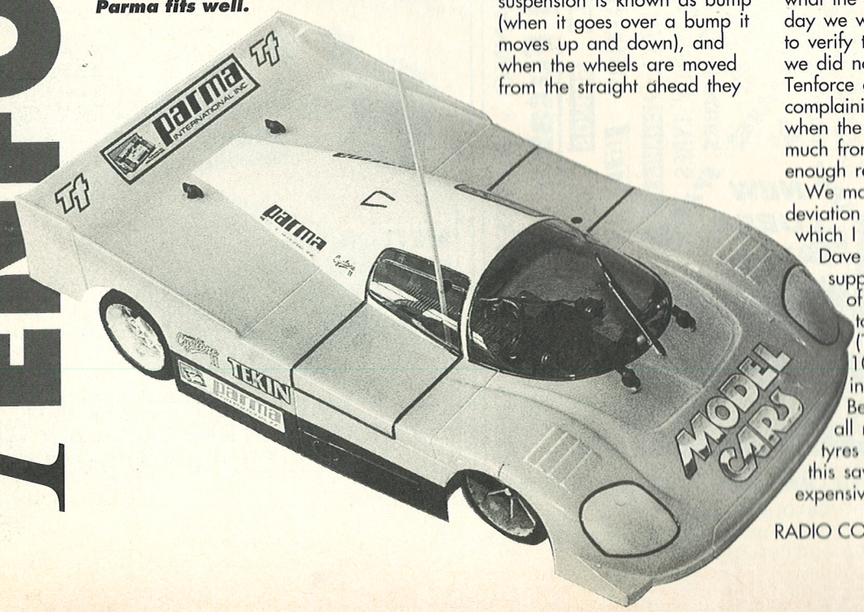
TENFORCE



Pete Winton goes racing with the Serpent Tenforce



Top; The finished car with the radio installed, cells fit in trays in saddle form and need to be tapped into place. Below; Toyota body from Parma fits well.

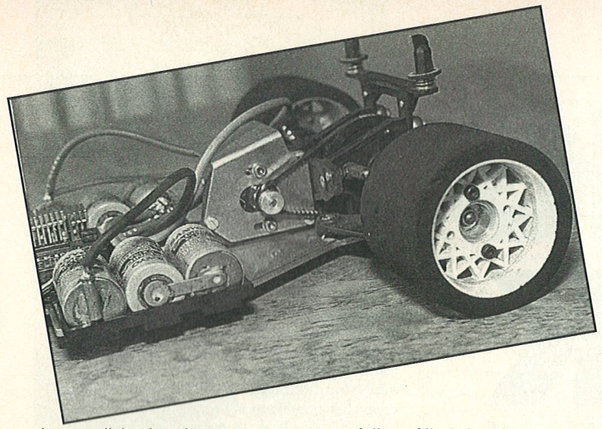


At the first 10th-Circuit national of the year on the Southampton RCMCC track last month, we took the RCMC Berton Tenforce car to FTD and a win in the A final. We found the car to be good out of the box, but not without some simple changes.

Our car arrived later than the car used for the photos accompanying the pre-release article, and so incorporated some small modifications to the prototype. One area which failed to go under the designers pen again was the steering linkages. As assembled, the system gives the front wheels bump steer. This is the condition which occurs when the linkages are not in line with the movement of the suspension, causing the wheels to turn in when the suspension moves up. The up and down movement of the suspension is known as bump (when it goes over a bump it moves up and down), and when the wheels are moved from the straight ahead they steer the car. If the up and down movement of the suspension (bump) causes the wheels to steer because of the position of the steering linkages, the condition is known as bump steer.

The problem with this situation is that when the car rolls in a corner the suspension moves up, and in so doing the steering linkages gives it more lock. We set about attempting to rid the car of this problem by mounting the steering servo on posts so as to raise the links. The problem was 95% cured. I decided to try the car with both links attached to the centre hold in the servo-saver as this gives more steering feel that the normal two position method. Since no back to back tests were possible it is difficult to say what the effect is (another day we will do some testing to verify the difference) but we did notice that two other Tenforce drivers were complaining of understeer when the RCMC car had too much front grip, and not enough rear grip.

We made one other deviation from standard, for which I am indebted to Dave Fletcher. He supplied me with a set of rear wheel adaptors to fit the usual BBS (TRC or Parma) style 10th-Circuit wheels instead of the unique Berton wheels. Since all my (limited) stocks of tyres are of the BBS type, this saved a considerable expensive, although on the



day I still had to borrow a set of Pinks to get the required handling/grip balance. I don't know if Dave will be making any more, but they are bound to be cheaper than a complete new set of wheels and tyres. For fitting the front wheels to the Tenforce axles, I needed some 8mm x 5mm flanged and shielded bearings which are readily available. SMB Miniature Bearings (0993-851535) can sort you out on this one, as I'm sure can Howes Models (0865-242407) even though this bearing is not on their latest list. Although they are slightly bigger than the 1/4in hole in a normal BBS wheel, they will push in and they do work well. Again, cheaper than a complete new set of wheels and tyres!

As regards the parts of the car which were in the kit, we fitted everything as standard. The dampers were supplied with a choice of pistons, and temptation led us to the variable-damping-rate types. These feature the ability to adjust the damping rate without changing the oil or the piston. The system looked well engineered, and we had high hopes that at last the system had been perfected, and we were able to throw away all our pots of shock oil for good. Alas it was not to be, the system suffered the same problems as every other attempt, too much friction, a notchy action as the damping is set harder, and leaks. Before the car ever turned a wheel, the dampers were rebuilt using the standard pistons noted in the instructions.

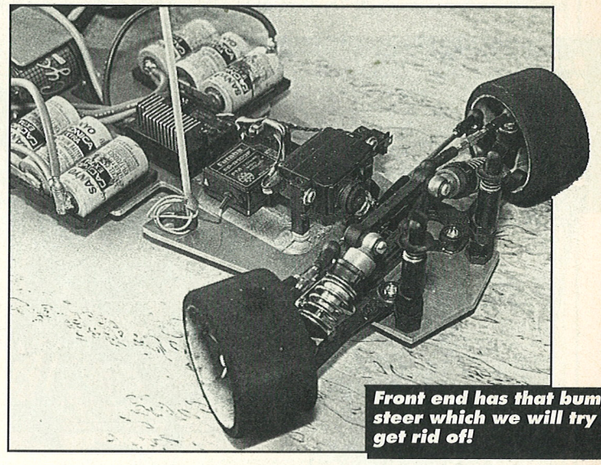
Even then, the damping action was nothing special, and so we removed the rubber diaphragms (used as volume compensators) and carefully refilled the dampers with proper hydraulic oil. This restored an action more akin to that required – smooth, friction free, and leak free. Later, at the track, we were told that everyone with Tenforce cars had done what we had, some on advice from the 8th-Circuit racers who have experience of these dampers on the Serpent 1/8th cars.

The car turned its wheels for the first time outside the house in the week before the race. Everything worked. We fitted a Parma Cyclone-II 17 double motor, Parma matched SCE's, a Tekin 411P speedo, Futaba radio gear and servo. A Parma Toyoto Group C bodyshell fitted perfectly onto the best body mounts you will ever find. I don't know if Kyosho copied Berton, or vice-versa, but these are the best mounts you will find anywhere.

At the dry but breezy (and cold) Southampton track we got two practice runs which concentrated on duration testing. The car was quick, noticably quicker than any other car in the 2WD suspension class, but not as quick as the Pro-10 cars. The weight limit for 2WD suspension cars is 3lbs (1361 grammes) as against 2lb 10oz (1191g) for the Pro-10 cars. That is a 14% weight penalty, or six ounces (170g) which is why the cars are slower. It is the equivalent of a 600kg Formula One car carrying an extra 84kg, or a 13 stone passenger! It is not the straight line speed which suffers that much, it is the power and time required to brake, turn and accelerate all that extra weight.

The RCMC Tenforce car was the lightest car in the class at 1420g (2oz over the weight limit) but that means carrying half a pound of extra weight over the Pro-10 cars, so the higher lap times were easier to understand. However, the extra weight does help grip, and the suspension gives more grip, so what we lost on the straights we seemed to gain in the turns where we could keep up a higher speed, especially in the two long open hairpins. My apologies to the two cars I rammed up the back in these turns whilst we appreciated the fact!!

It was clear from the first round that the car was difficult to turn into the bends, and lacked grip on the exit. After four rounds experimenting, we ended up with the smallest castor wedge on the front, stiff front anti-roll bar, and soft rear anti-roll bar. This worked well, our lap times dropped to a consistent 23.5 seconds compared to 22.5 for a B or C final time, and 21.75/21.9 for an A final time. Our FTD run showed an average speed of 25mph for the whole race.



Front end has that bump steer which we will try to get rid of!

Despite a spin on the second lap, the A final went well and we won by 20 or so seconds from Pete Holm. In four minutes we were 0.16 seconds away from 100 laps (that spin I expect) which would have been a quickish 13 laps for the full five minutes. My driving on the day would have got a Pro-10 car into about the B or C final, which makes the Tenforce about 15 or 20 seconds slower, not far away from the 1 to 1.5 second a lap difference discussed earlier.

The key difference is that the suspension car is so much more forgiving to drive that most component club racers will get it round with more ease than a Pro-10 car. This is reflected in the times above, and a decent diet for the Tenforce should put in on par with the conventional Pro-10 cars.

In the final analysis the car was good, but still lacks definition in the steering around the straight ahead. Minor corrections off line were difficult to achieve smoothly, and the initial turn in to corners was vague. I feel sure this has something to do with the steering set-up we chose, and maybe the kit servo saver. We have changed the steering rod set-up to a more conventional system as shown in the attached photos. The basic design of the car is excellent, and is not suspected as being part of this problem.

Overall I found the car impressive. A diet to reduce its weight to around 3lb or less is urgently required to give more speed. The main culprit has to be the (immensely strong) aluminium chassis which weighs 8oz bare and is over-engineered for the job. A carbon-fibre reinforced resin replacement would be as strong, and probably half the weight.

We can recommend the Berton Tenforce for the 2WD suspension class of 10th-Circuit racing. It is easy to built, easy to set-up, and very strong and reliable. We shall report again after the diet!!