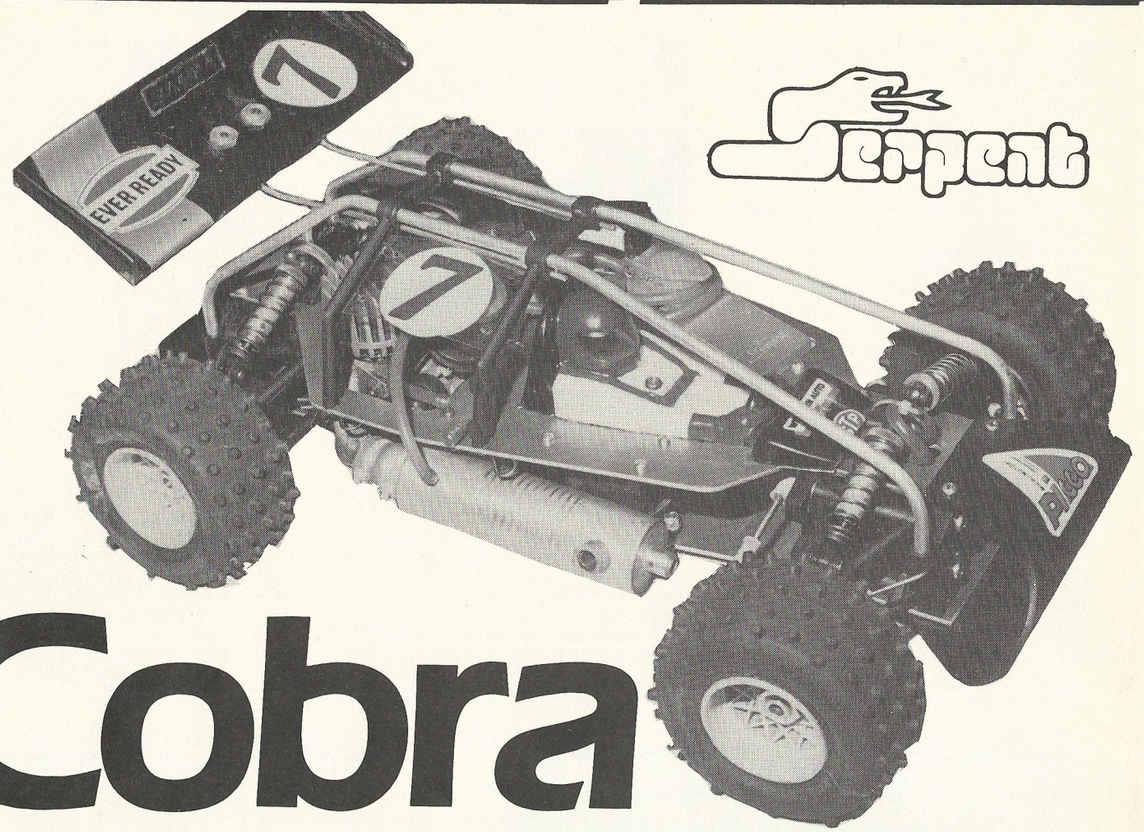


Cobra

Bill Burkinshaw tries his hand at some Snake Charming

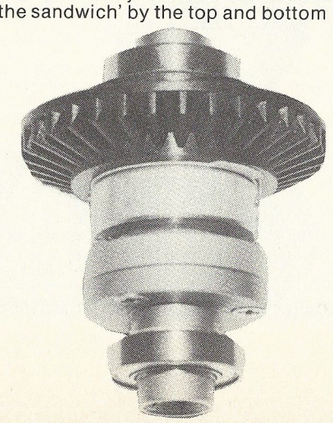
DON'T EVER BE misled by appearances! If you follow this mistaken route you are likely to pass many good things by. The *Serpent* 'Cobra' looks simple and like so many examples of good engineering, the apparent simplicity belies a host of carefully thought out, well engineered, quality features on this new, Dutch manufactured, four wheel drive, 1/8th scale Off-Road racer from the *Berton* Engineering concern. Designers Peter Bervoets and Ronnie Ton have thought long and hard about this car and incorporated many of the mechanical features well proven in their Euro-champs winning circuit racers, taking particular account of the more rugged demands of off-road racing.

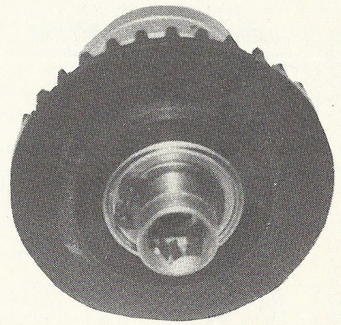
In Brief

In standard form the car is fully independently sprung on double wishbone suspension with hefty inter-linked oil filled coil over shock suspension struts. Drive is carried fore and aft from the longitudinally mounted engine by a shaft system. Bevel gears turn the drive through 90° thence via *Serpent's* well proven adjustable ball differential through solid drive shafts to the wheels. A twin disc brake is fitted to the rigid centre shaft, on a square section carrier that also supports the centre main gear.

A centre differential is available as an optional extra.

Glass-filled nylon bulkheads support front and rear differentials and suspension components which are then effectively sealed as the 'meat in the sandwich' by the top and bottom full length aluminium alloy chassis plates. The overall assembly of the car is particularly well done, for, although at first glance at a completed car maintenance looks all but impossible, it is a matter of only 5 minutes' work with a screwdriver to remove the lower chassis plate complete with engine and exhaust system and reveal the full drive and R/C system. This particular boxing in of the drive train gives valuable protection to the differentials, bearings and bevel gears and protects the R/C equipment as well.





First stage in construction is assembly of the two differentials. Do use thread lock on the adjusting ring clamp screws – we guarantee you will lose it unless you do!

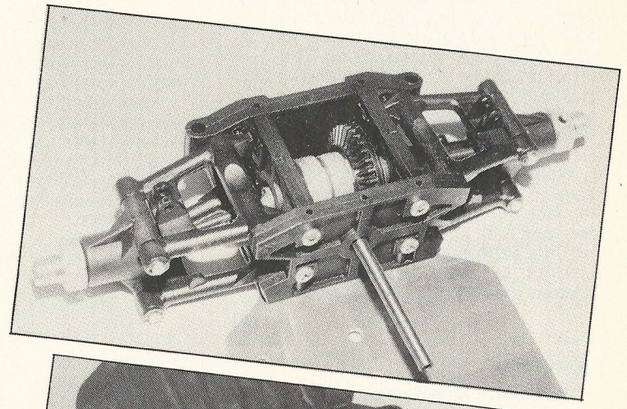
Assembling the Serpent Cobra

Introductions are good, although some slight confusion over terminology may arise as Dutch translations into English falters occasionally. However I found no difficulty in assembly of the car, the fine 'exploded' view drawings being particularly useful. Differential assembly starts the whole thing off and here I must stress the importance of really thoroughly tightening up the socket cap screws which lock the adjusting rings. A good rule of thumb for adjustment of these differentials is to tighten them up a little bit more than you think you ought to! Ball races are in general a particularly good fit in the moulded housings throughout and I would recommend that the sharp edges of the housings are chamfered very slightly with a sharp scalpel before assembly. It is possible for the bearings to cut small pieces of plastic off the corners of the housings as they are pressed in. These can be trapped underneath unless this precaution is taken. The aluminium spindles for all the wishbones are very tight in the bulkheads and whilst I accept that as the car is run, they will bed down, I chose to ream the holes with a 5mm hand reamer on assembly.

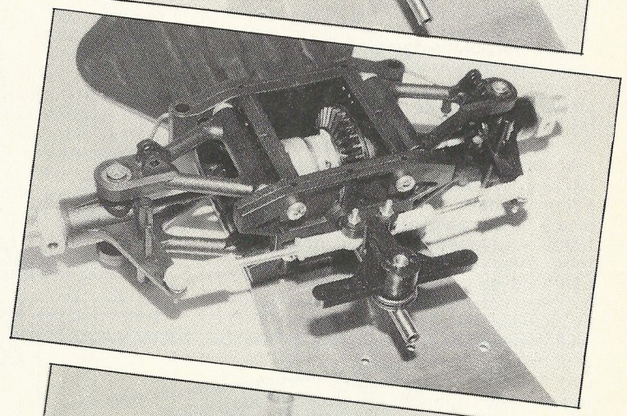
No provision for controlling end-float on the rear drive shafts is mentioned but experience with running the car leads me to advise the addition of flexible pads in the hexagonal drive cups. I cut four 'bobbles' off a set of spiked off-road tyres and used the resulting mini rubber cones to pad out the cups until the end float was set at 0.5mm. (Thanks for the tip Alan.). There is a set of plastic pads for setting the front drive shaft end float, be warned, they are tricky to trim and will require patience. I was impressed with the fit of the hexagon ball and socket drive shaft joints, no discernible play was present, evidence of very good manufacturing tolerance control.

Minor Mods

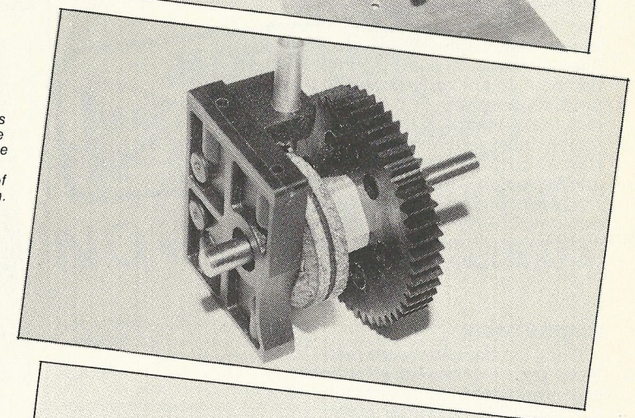
One of the plus points of having to wait in the queue for a 'Track Test' kit is that one is able to see one or two examples of the car performing and assess likely problems. To be fair, the 'Cobra' was seen to be remarkably trouble free with the exception of two areas on the front end. The servo saver and the brass inserts which the universal ball pivots screw into for steering and suspension movements. On the former I noted that the spring had a tendency to lift from the correct



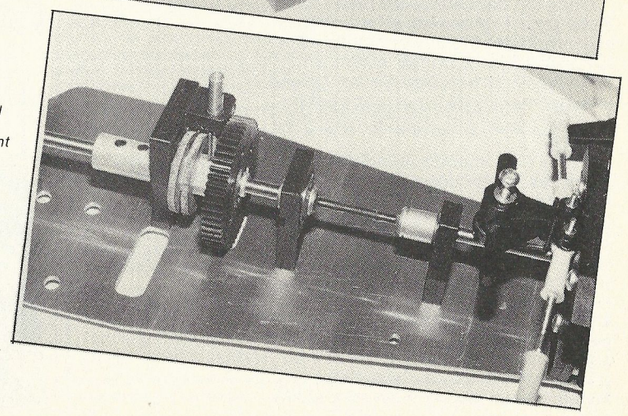
Right: very substantial plastic mouldings are used for this car, fixed together with 'meaty' self-tapping screws. Check the wishbones for a smooth, free fit on the spindles.



Right: the servo saver is mounted on the underside of the top chassis plate, check that the ends of the springs have clearance.



Right: dual fibre discs are used on the brake which operates on the centre drive shaft. Plastic drive gear is of massive construction.



Right: the short centre hexagon ball drive shaft floats to allow a small amount of chassis flex without locking up the whole drive system.

place and insured against this by fixing a 6 × 25mm strip of 1.5mm aluminiun onto the top of the servo saver thus trapping the spring. The latter brass joints have been known to pull out of the plastic mouldings so were pinned in place with short lengths of 1.5mm wire. I also took the time to fit ball races to the servo saver.

When it comes to fitting the flexible section of the longitudinal drive shaft in place don't panic! I know it appears too long to fit and the instructions give no indication as to how it should be inserted, but, quite simply flex the chassis until it pops into place.

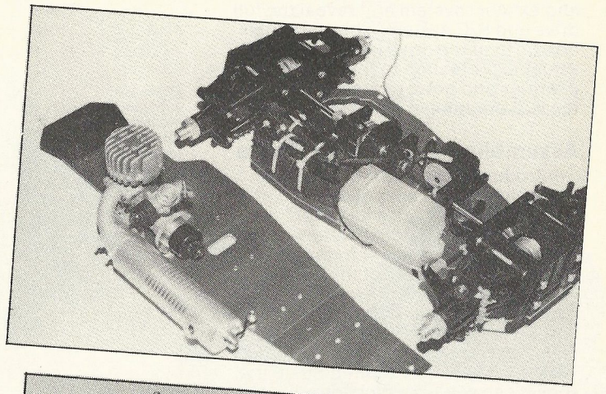
Dampers

Assembly of the dampers proved quite time consuming; there are a lot of parts and the diagram is on the small side. However, take your time, lay out all the parts first and examine the diagram carefully and you should manage it. I did, and I was building my car to a deadline for this 'Track Test'. Filling the dampers with oil takes time also. The two pairs of dampers are both linked together with silicone tube. This system seems to be a good compromise over more complex constant volume dampers and works by allowing the oil displaced by the piston rod to be accommodated by expansion of the relatively flexible silicone tube. I filled the dampers one at a time then connected a length of oil filled tube and by pumping the dampers up and down air was gradually expelled into the tube. Then with the damper fully compressed, a freshly filled section of tube was slipped onto the connecting nipple and sealed until the next damper was ready for connection. With a few minutes too-ing and fro-ing the system was virtually bled of all air and worked very well.

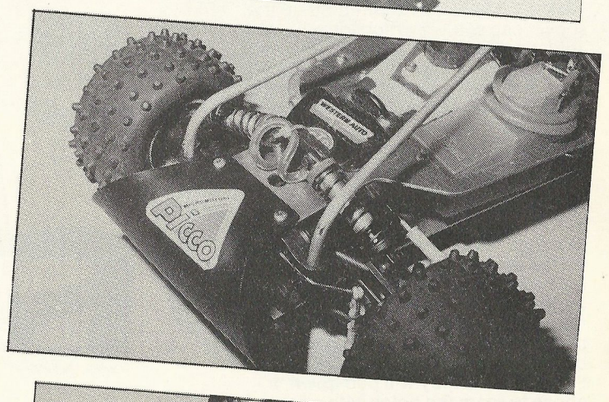
Engine room

Once the dampers were ready for installation I turned my attention to preparation of the power plant, in this instance a *Picco* 'Buggy' motor with 7mm *Picco* carburettor. *Serpent* make exhaust manifolds for most popular engines but do not include a manifold in the kit.

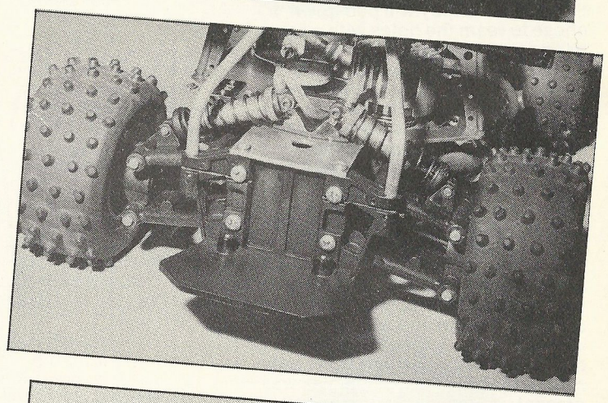
A mini pipe silencer is included plus the necessary silicone tube to seal the manifold at the silencer. At this stage quite a lot still remains to be done for although the top chassis plate looks ready to bolt on it will be apparent as soon as you try that it won't! This is intentional, for rather than cut out an all-encompassing hole in the plate and weaken it needlessly, *Serpent* cut an approximate hole leaving the builder to shape the rest to suit his own installation precisely. Several trial fits



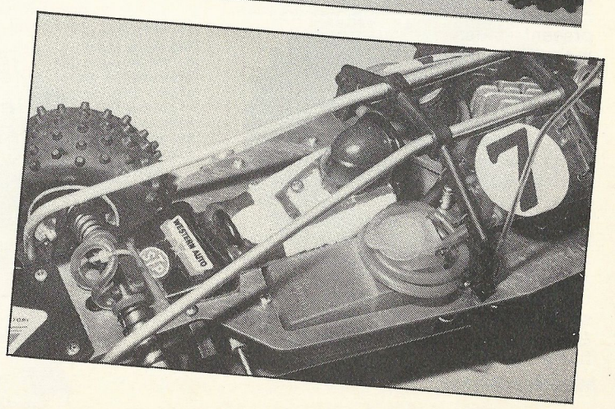
Right: servicing is really easy, 16 self-tapping screws are slipped out to remove the engine and silencer and reveal the whole works.



Right: silicone tubing is used as an interconnection between the dampers – slight give in the tube compensates for changing volume.



Right: rear dampers also interconnected, note also small moulded plastic rear bumper.



Right: don't forget to fit a driver, necessary if you wish to race to BRCA rules. Coil of tubing helps prevent syphoning from the tank on engine over-run.

and filing sessions produced a plate that fitted but it was very obvious that access to the carburettor adjustments would be difficult. An additional notch was filed for idle mixture adjustment access but I finally had to resort to making an especially long and thin screwdriver for the tick-over screw. Whilst working on the 'engine room' I decided to modify the *Picco* needle and jet assembly into a simple 'Banjo' fitting and use a remote needle which would be easier to get at.

The 4-pin clutch is very simple but does need careful trimming for correct operation. There are no springs, the PTFE material flexes to allow the shoes to spring out into contact with the drum. It must be thinned between the two pins so that there is sufficient flex otherwise excessive clutch slip will result.

R/C installation

Once the top chassis plate is fitted round the engine, a hole must be cut for the throttle servo and holes for the steering servo mounting brackets. Dimensions are provided for fitting these items and all the necessary over-riders, links, brake adjuster, etc., including a pair of heavy duty moulded servo discs to suit *JR/Sanwa* servos. Receiver and battery pack are suspended between moulded plastic posts on rubber bands. Space is tight here, think out the routing for leads, etc., carefully before settling on an arrangement. A particularly good fuel tank is included. With the exception of that supplied with the 'Presto' this is the only tank in an Off-Road kit I have come across that didn't leak!

Finally, the roll cage was assembled and fitted into place and the 'Cobra' was ready to roll.

Snake in the grass

I can quite honestly say that this car was a delight from the the first turn of the wheels. It is very stable and predictable and positively enjoys being driven fast. Within reason the faster one pushes the car the easier it becomes to drive, probably because of the 4% higher drive ratio on the front wheels. Four wheel drive cars do take a little getting used to but the overall secret seems to be 'keep the power on'. Chopping the throttle promotes a nice little bonus of oversteer which definitely helps things if a corner suddenly seems too tight! I found it unnecessary to resort to any modification to suspension spring rates, tyre balance or ride height to make the car very drivable. The car is light and acceleration from a standing start is good. In three heats at the most recent race meeting my 'Cobra' was first into the first bend each time.

I have now run the car for several hours on the track and the various little findings that I have made are included in the foregoing account of assembly. The main mistake I made in first assembling the car was in trimming the clutch shoes and I had to eventually fit a replacement. For improved reliability and low wear rate I would strongly recommend end-float control pads for all the drive shafts and also a more secure fitting of the brass bushes in the steering uprights. Over to you *Serpent*. In conclusion this car is to my mind one of the best kits I have ever assembled and competitive in top class Off-Road racing as well.

Distributed by *Elite Models*, 145 Newgate Lane, Mansfield, Notts.

Price: £225.00.

Optional extras: centre differential, 2 centre clutch bearings. Alternative gear ratios.