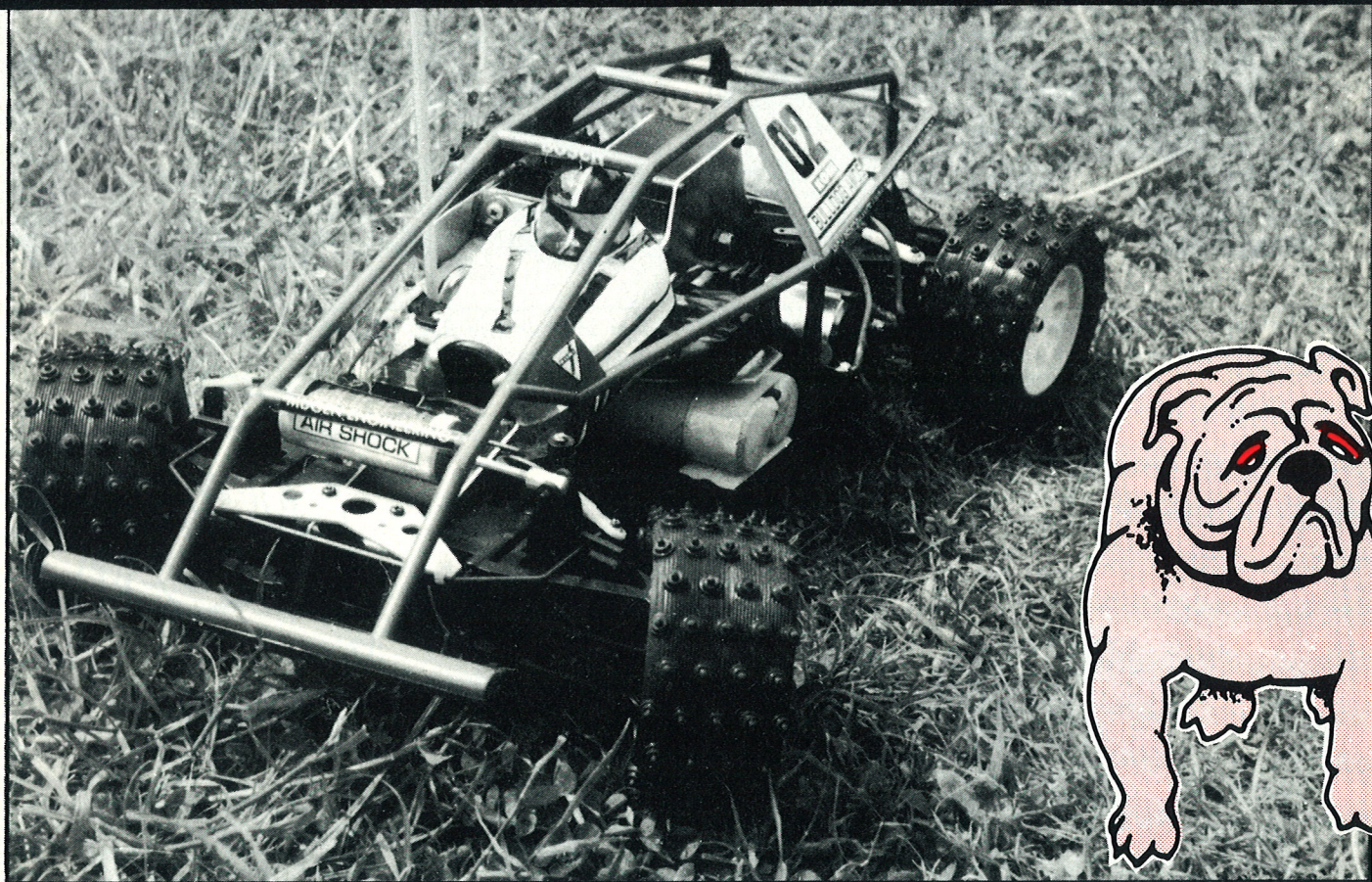


Mugen **BULLDOG** AW17S



The very latest from Japan, this four-wheel-drive-and-steering racer has been reviewed by JEREMY ROBINS. The kit is distributed by Irvine Engines.

Yet again we have another new company entering the 1/10 scale off-road market. The company is Mugen — the car the 'Bulldog'. Mechanically the car itself could be called the 'Ultimate' with four wheel drive, four wheel steering and three limited slip differentials. Is it going to be the ultimate in terms of 'driver friendly' and putting power on the track? That's one thing that will be found out in this review.

The appearance of the car is very striking with a blue plastic roll cage and two huge air filled dampers, one at each end of the car.

Assembly starts with the building of the three ball type limited slip differentials. This takes sometime and is tricky but is worth doing well to provide smooth free running transmission. The middle diff. is driven directly by the motor and obviously cuts any power loss to a minimum. This diff. provides drive through a belt system to the front and rear wheels and despite the gearbox not being ball-raced the transmission is extremely quiet and

smooth after only a short period of running in.

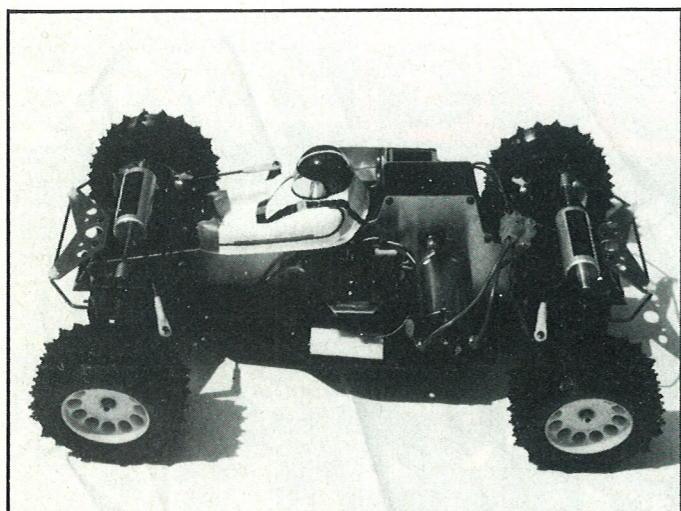
The next part of the car to be tackled was the suspension.

This task was extremely easy as both the front and rear suspension are identical. The double wishbone suspension comes fitted with anti-roll bars as standard and helps a lot to stop excess body roll when the car corners at speed. By varying the amount of washers used to mount the lower suspension arms, caster adjustment can be created, thus adding to the car's already numerous steering set ups. The complete suspension has been manufactured to a very high quality combining lightness and strength. The drive shafts are made of hardened steel and are of the 'ball and pin type' now common on most off-road cars. The air dampers can now be fitted to the car and come ready built with a socket head bolt which when screwed into the damper provides different rates of dampening strength. The dampers are very effective and seem to smooth out even the roughest

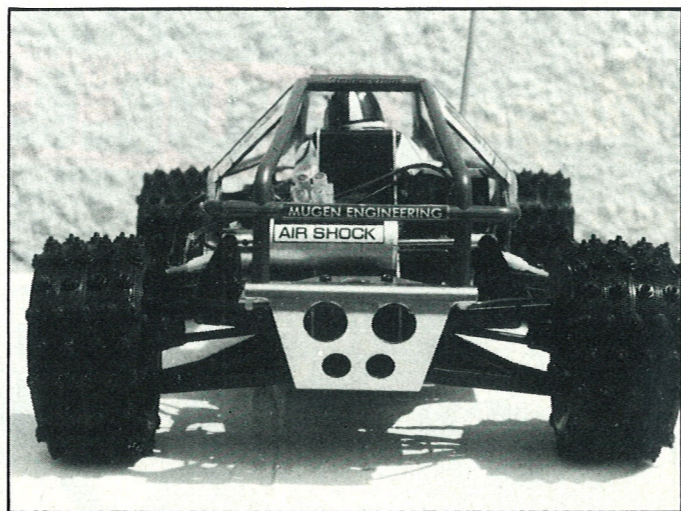
of bumps.

The servos can then be fitted to the sides of the gearbox, by the means of servo tape and tie-wraps. The steering servo is placed at the front left hand side balanced out by the speed controller servo on the right side of the car. The three speed controller is fitted above the transverse drive battery and is linked to two resistors which are attached at the back of the car. For this review an electronic speed controller was fitted and to get an even weight distribution the receiver was mounted where the speed controller should be fitted and the electronic speed controller fitted to the space provided for the receiver. Care when purchasing a new electronic speed controller should be taken as it seems that only certain devices will fit inside the roll cage. A kydex under plate is then screwed onto the underside of the gearbox and provides the area on to which the drive battery is mounted.

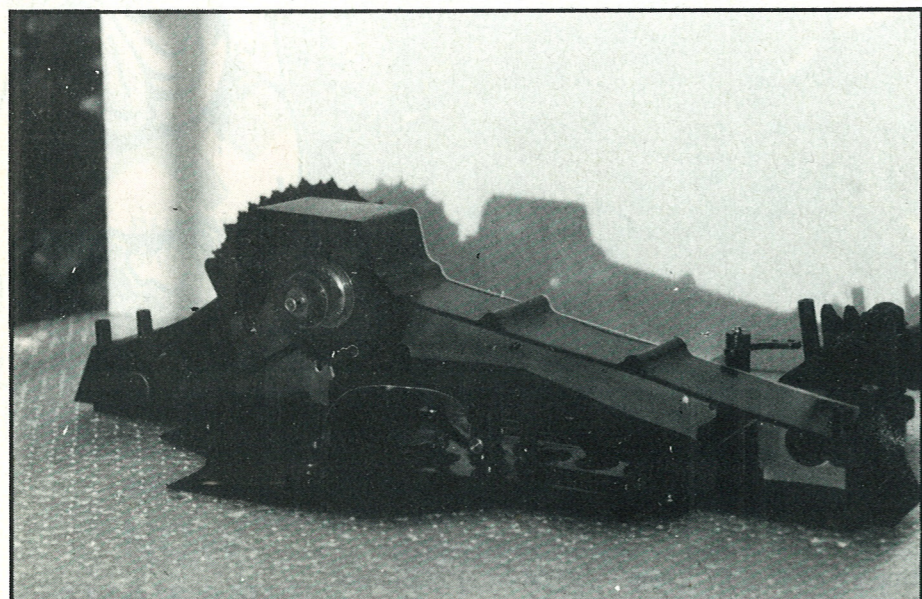
As we have now become accustomed to the tyres having to be glued to the wheels, the tyres are of the new



With the cage removed, the Bulldog looks very simple. Most obvious feature — the huge air dampers. Note also the exposed mid-mounted motor.

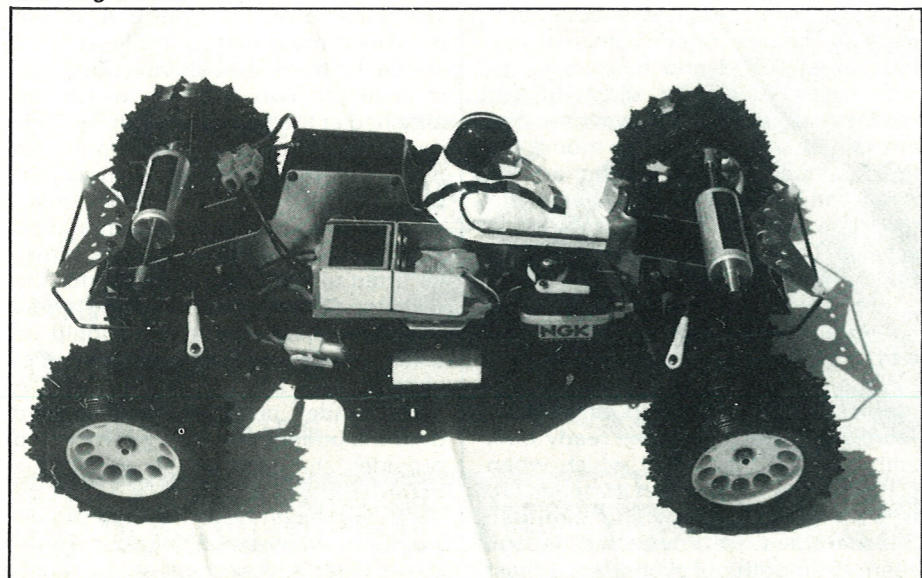


Rear view of the Bulldog, emphasising its squat profile.



A completely enclosed fore-and-aft transmission, using belt drives, is just one of the Bulldog's good points.

Right side view of the car shows the non-standard speed controller and the steering servo.



profile type, with a 'spiked stud' tread pattern providing superb grip on most surfaces.

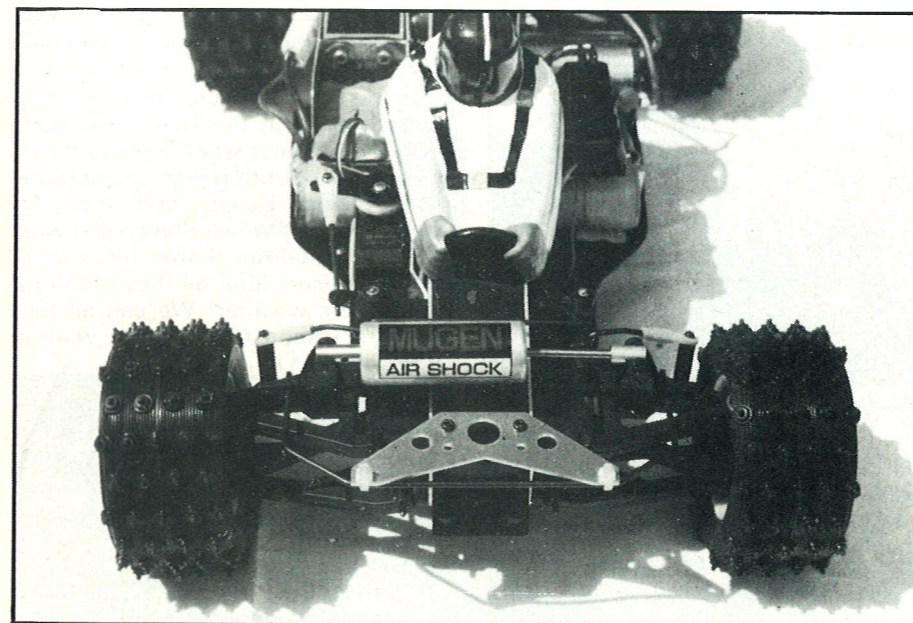
Possibly one of the hardest jobs in building the car is to set up the steering. The steering drive, is from an upright servo through four bellcranks and one output mounted servo saver. The trackrods are hardened steel and have heavy duty trackrod ends fitted as standard.

At this stage the roll cage can be mounted and it incorporates a front bumper and two side mounting plates for your car number. A lexan driver figure is also supplied and has to be painted and stuck to the top of the gearbox to finish the assembly of the car.

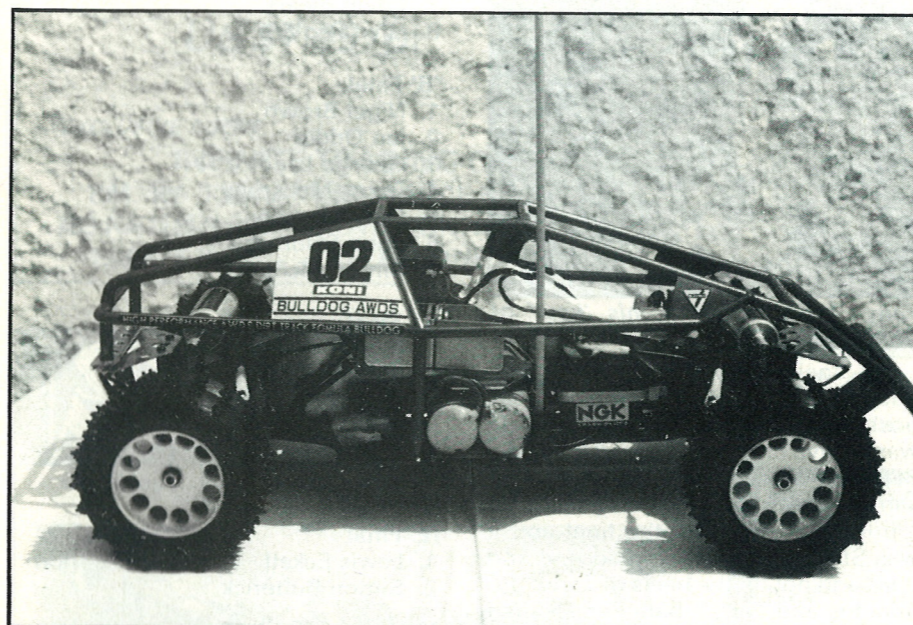
Careful attention to weight has obviously been paid, because with a ready to run weight of 1560 grams it makes this car probably the lightest standard four wheel drive car on the market at the moment.

With a newly charged set of cells a visit to the local park was obviously the ideal test ground to put the car through its paces.

One thing you really notice when you put the stick forward is the way the car accelerates off the line. After

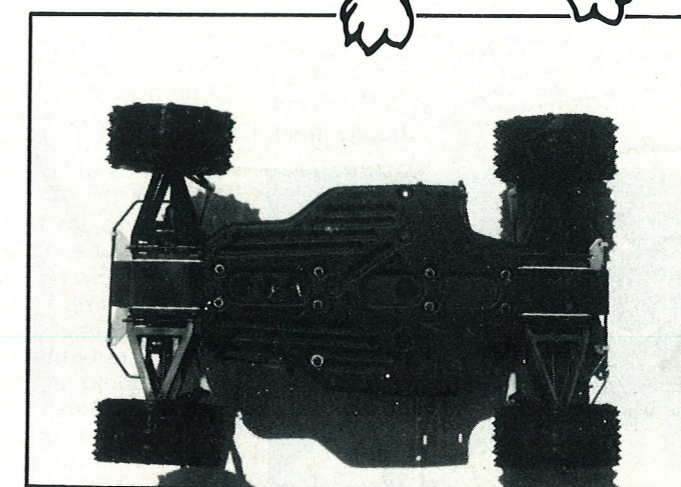
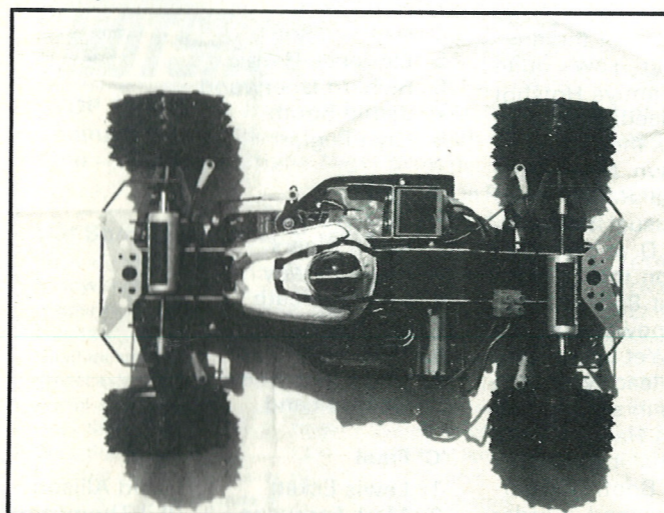


Front suspension, showing the anti-roll bar.



The battery position is very evident in this view.

The very compact lines of the car are evident from this bird's eye view.



Underside protection is very complete, as this view shows.

driving a two wheel drive car for the last year I expected the four wheel drive system to be a little slow in providing power to the wheels but this was not the case at all. One can only assume that this is due to the fact that the simplicity of the belt drive system absorbs very little power.

The top speed of the car was also very good and lasting five minutes was no problem, with 1.4AH cells, the car looked in excess of nine minutes.

After minor caster adjustments to the steering the car was almost impossible to roll even in the tightest of bends. At first the steering is quite hard to get used to after driving a standard two wheel steering car, but one soon adapts to the different characteristics and it becomes very predictable and easy to drive.

The suspension works extremely well and because there is no oil to leak from the dampers they should not gather dust and grit, which over a period of time wears badly the normal oil filled damper.

As yet the car has not been used in competition but by the performance already shown I believe that it will be the car to look out for in the 1985 racing season.

Distributed by Irvine Engines, Unit 2, Brunswick Industrial Park, Brunswick Way, New Southgate, London N11 1JL.

