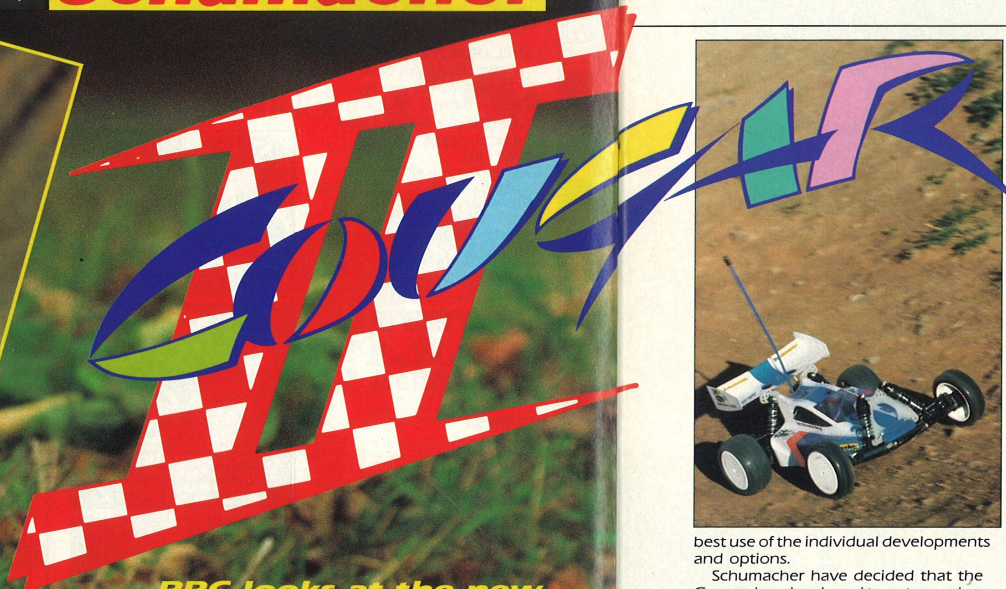
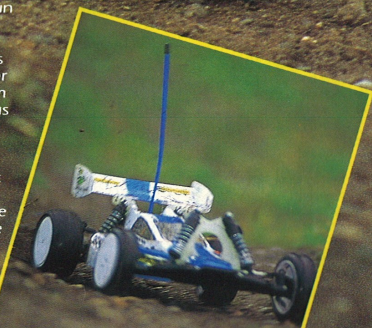


Schumacher



RRC looks at the new Cougar II in detail.



The pace of development in off-road R/C racing in the past few seasons has been rapid to say the least. As a result all the major competition cars have periodically acquired suffixes to their names. All the leading manufacturers have released upgraded competition models in such a way.

We at RRC have featured the Yokomo Dogfighter Works '91, several versions of the Losi JRx, and more versions of the Optima than there are 'Rocky' sequels. The world famous RC10 has been kept alive in just the same way, with the introduction of the 'Graphite' and 'Team' cars, and the stealth transmission.

The latest model to be released on to the market is an upgraded version of the Cougar, Schumacher's 2WD

competition car. The Cougar was released in mid 1990 (yes, it does seem longer ago than that doesn't it?) as a budget priced competition car which, with the addition of ballbearings, could give any 2WD car on the market a run for its money.

Since its initial release Schumacher have continued to develop the car, as they do all their products. Schumacher test possible developments in their team cars and if proven to be advantageous are promptly released for sale to the public. This policy has allowed many Cougar and Pro-Cat owners to keep up with the latest developments without having to invest in new cars. But the 'flip-side' of this fact is that not everyone can appreciate or understand and make

What's New (All Models)

Some of the new mods feature on all three models of the Cougar II, including the following:

Chassis

The Cougar II will be based around an anodised red chassis to please the fashion victims of off-road. It does look very 'sexy' and with a film of adhesive plastic underneath (eg Litespeed Tuff Stuff), should stay like it.

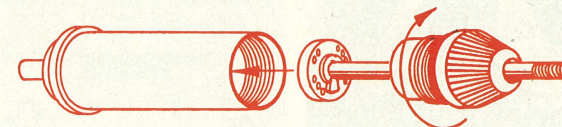
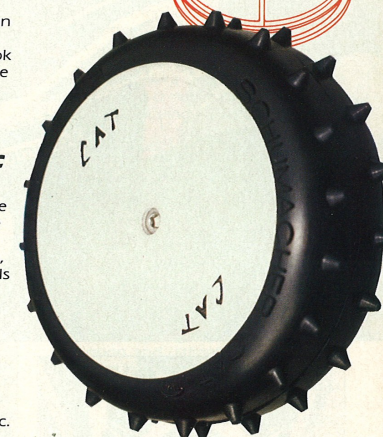
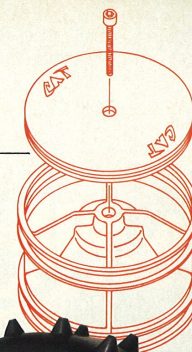
New 2.2in. Aerodisc Wheels

Schumacher have even redesigned the wheel for the new Cougar II. They have gone for a marginally wider wheel at the 'en-vogue' diameter of 2.2 inches, for improved road-holding. The wheels now come in two parts which 'clip' together.

New 2.2in. Green Compound Tyres

Softer compound mini-spikes provide better grip especially on dirt or tarmac.

2.2in. disc wheels and 'Green' compound front tyres.



best use of the individual developments and options.

Schumacher have decided that the Cougar has developed to a stage where a new car should be released which includes all the worthwhile modifications available. In order to maintain the Cougar's appeal to everyone from the novice street racer, new to R/C cars, to the power-crazy competition driver, the 'new' Cougar will be available in three specifications.

The Range

As could have been expected, the established Cougar name, although suffixed, has been retained by Schumacher. The Cougar family has, however, gained three sons with differing attributes. Schumacher have released at the top of their 2WD range the Cougar II 'Team' car which is a real lean, mean, fighting machine. The 'Team' car does not know the meaning of the word compromise and so is fitted with every modification feature available. This model is for the person where financial restraints do not get in the way of winning.

The second car in the range, and the one which we predict to be the most popular in terms of sales, is the Cougar II 'Racing' Car. This model is the ideal compromise between performance and cost. Only a few of the more expensive features, which are only needed in particularly tough competition or nasty conditions are omitted. This keeps the cost to a more reasonable level but allows upgrades to be made when finances are available.

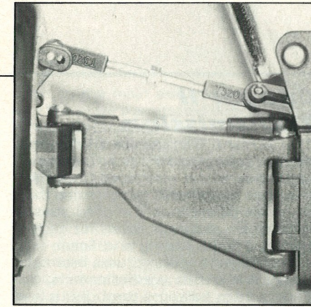
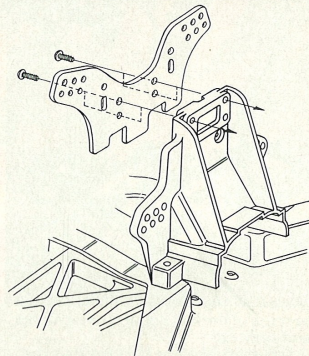
Finally, the introduction model is the Cougar II 'Sport' Car which fits the design brief of the initial Cougar — a car that is attractive to the beginner, which could take him/her to the highest levels in competition.

Shock Absorbers

We were surprised to see Schumacher move away from their tried and tested shock absorbers, so we were very keen to see the new items. The shock bodies are effectively blind tubes, made from anodised alloy. This will no doubt prove to be very hard wearing as the anodising is quite thick.

The seals are carried in the moulded cap of the shock through which the piston runs. An 'O' ring between the body and the cap seals the body assembly. Also in the cap is a closed cell foam insert which acts as a diaphragm to take up volume changes in the stroke. I would imagine that it also helps seal the shock around the piston together with the two internal 'O' rings. This particular design will be advantageous as only second-hand pressure is applied to the diaphragm, ensuring that all damping is via the oil. Also, the air is enclosed within the foam rubber diaphragm which cannot leak to cause air locks within the shock (a common problem with cup diaphragms). The pistons also feature multiple holes which can be exposed or sealed by a second flush fitting face of the piston. This allows a quick change of the damping effect without changing the oil or raiding the spares box for alternative pistons.





the bearings which receive the 'load' sit inboard of the gearbox housings. Under extreme loads they (the plastic ones) flex which may result in momentary belt slippage.

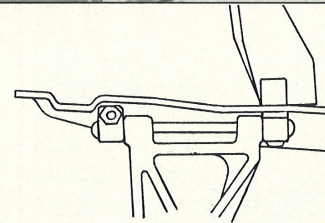
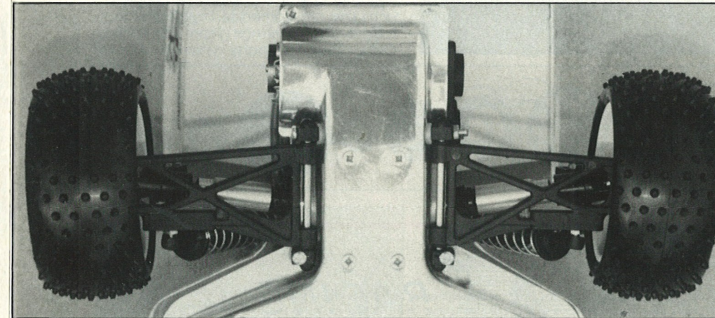
The solution to this problem up to now has been to replace them with expensive alloy eccentric housings which cannot flex. The solution to the problem on the Cougar II range is to move the bearings in line with the gearbox housings so that the loads are directed through the gearbox side plates. Therefore, alloy eccentric housings are no longer required to handle the hottest motors.

Wishbones

Front: New swept wishbones are used. Due to changed geometry these give more steering control. We will not go into geometrical detail but the pre-production versions transformed the RRC Cougar. The smooth underside of the arms protects the shocks, and help the car ride over rough tracks. They are also very easy to clean.

New Wing Mounts

The original idea for an R/C 'knockback' type wing was inspired, the new design does away with the little pin which was so difficult to fit and replaces it with a small screw.



New Bodyshell and Wing

The Cougar II is fitted with a two-part bodyshell and wing. A small nosepiece fits in front of the larger varimount shock tower, behind which sits a low, sleek bodyshell of a more futuristic design than that of the original Cougar. Personally, the bodyshell is not to my taste as it doesn't look like an aggressive desert racer. Anyway, beauty is in the eye of the beholder and I have heard many more positive reactions to the Cougar II's new style.

Rear: Wishbones remain unchanged, other than they pivot on much stronger 1/8in. pivot pins. All the wishbones are moulded from a new state-of-the-art material which gives incredible rigidity and very good toughness. These wishbones are very rigid and so make the shocks do all the work, as well as keeping the geometry in 'status quo'. This is a major step forward in our opinion.

New Eccentric Housings

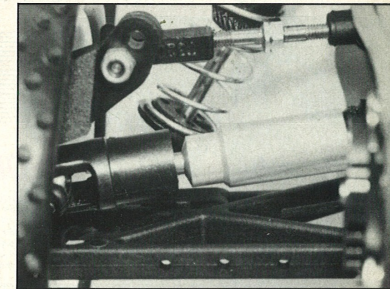
The eccentric housings used in the Cougar which evolved from those used in the original Cat, have recently become somewhat inadequate due to the extra power used in today's top competition motors. Their problem lies in the fact that

Roller Driveshafts (Team Car Only)

Universal joints (UJs) are the most efficient method of transmitting power between two out-of-line shafts as only minimal frictional losses are encountered between the rotating parts. UJs, however, cannot accept longitudinal movement loads like a ballpin drive. This is why most driveshafts are UJ one end and ballpin the other. However, ballpin drives are not at all efficient unless the shafts are in line, which is never the case in the continually moving suspension of an off-road car.

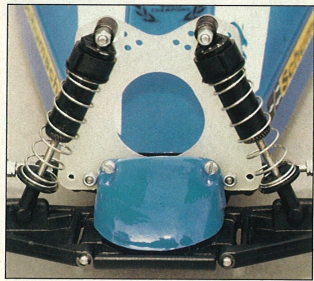
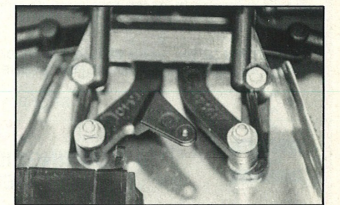
In order to achieve maximum efficiency Schumacher used twin UJs with a telescopic shaft to provide the longitudinal movement. The drawback of this is that the telescopic action is restricted due to friction resulting in the torque transmitted by the shaft. So, under acceleration and braking, the suspension effectively becomes stiffer due to friction in the telescopic shaft. The telescopic roller driveshafts remove this friction, giving super smooth suspension and ultimate efficiency under the hardest acceleration.

This is a revolutionary design and is possibly the most advanced method of driving the wheels on an R/C off-road buggy.



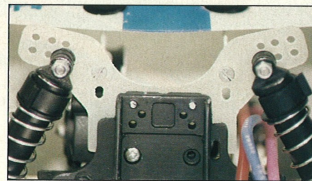
Ballraced Steering Levers (Team Car Only)

The Cougar II team car utilises ballraced steering levers for super smooth, super quick steering response. The levers are moulded from the latest 'performance engineered polymer' to maximise rigidity, to give optimum steering control whatever the steering load.

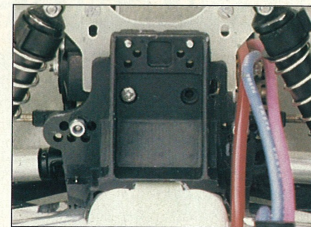


Front adjustable shock tower.

to be fine tuned to the track or conditions. This gives a convenient method of making such adjustment without the need of internal shock spacers and/or spring changes. These adjustments are explained in the manual and so are less daunting than they initially seem.

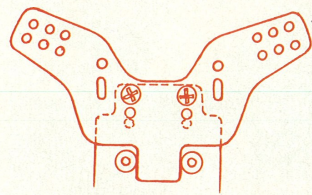
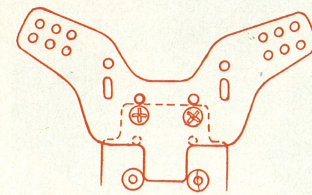


Fully adjustable rear shock absorber tower.



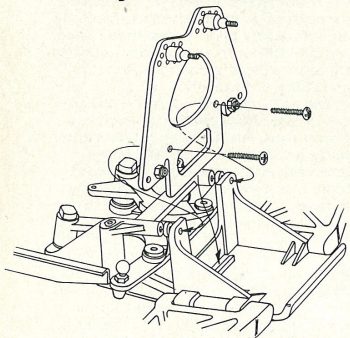
Varimount Rear Suspension Top Link

Changing the length and position of the top link alters the chamber change through the suspension travel. Generally the longer the top link the less the camber change. The footprint and so the grip of the tyre during cornering can be changed quite dramatically using this method, which is ideal for a variety of different track surfaces.



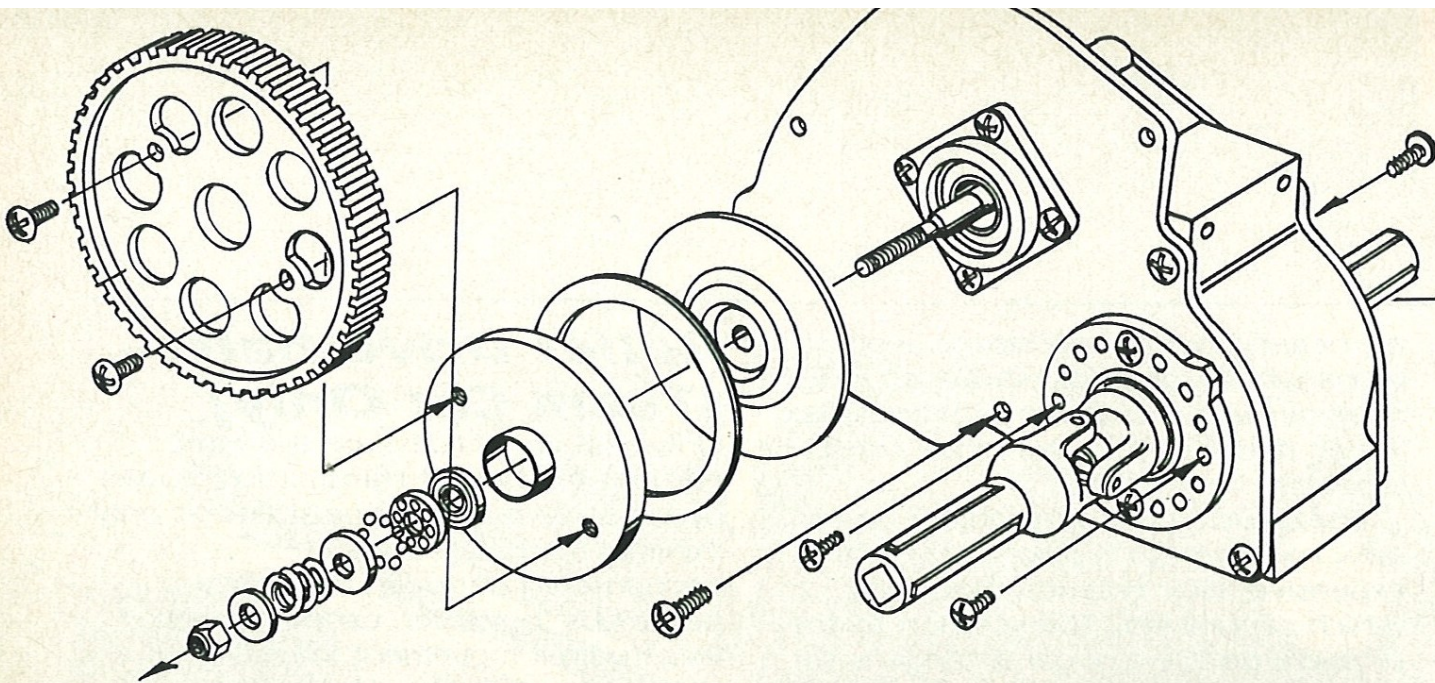
Whisper Gears

The Cougar II features precision cut 48DP gears which run almost silent. These are light years better than the moulded black gears.



Varimount Shock Absorber Towers

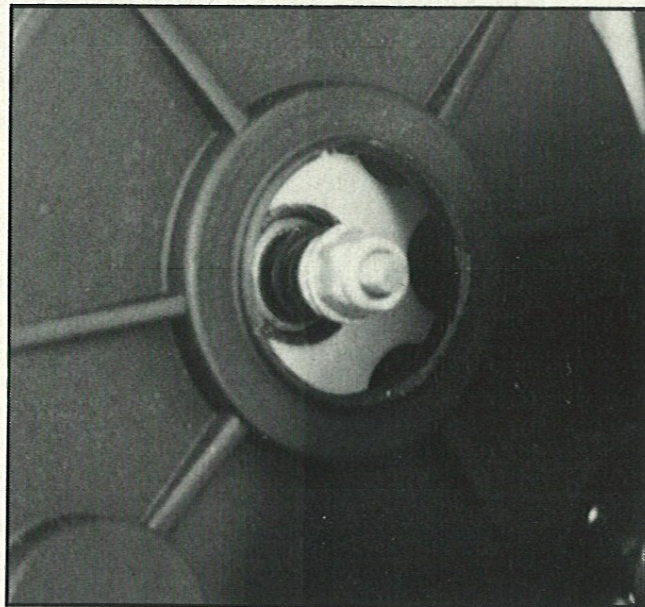
The Cougar II series features multiple mounting holes for the shocks on the front and rear shock mounts. The rear shock mount can also be fitted onto the rear bulkhead in a high or low position. This Kyosho-like strategy enables suspension drop, travel and spring rate



New Slipper Clutch (Team Car and Racing Car)

The original Schumacher slipper clutch was a 'pain' to live with, changing a spur gear was a major problem, especially if a clutch setting was to be maintained.

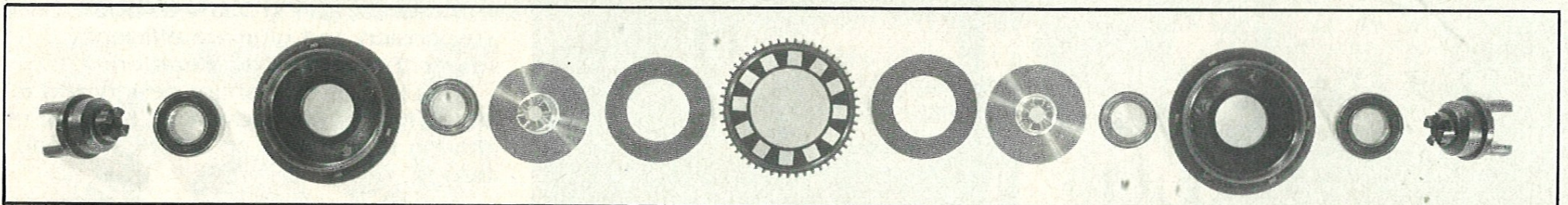
The new slipper uses a large diameter single plate clutch with a thrust race and coil spring for setting rather like the RC10 Stealth gearbox. Spur gears can be changed without altering the slipper setting. This unit is no better at its job than the Mk1 slipper but is much nicer to work with!



Cougar II Transmission

The Cougar II transmission uses a new stronger layshaft pulley and a hi-torque 6mm wide kevlar reinforced toothed belt. The major area of refinement is the ball drum differential. The diff comes in three levels of specifications for each model — Sport, Racing and Team, respectively. The 'Sport' uses bronze bushes and plastic washer carriers, the 'Racing' uses ballraces throughout and plastic washer carriers, and finally the 'Team' spec uses ballraces and alloy washer carriers.

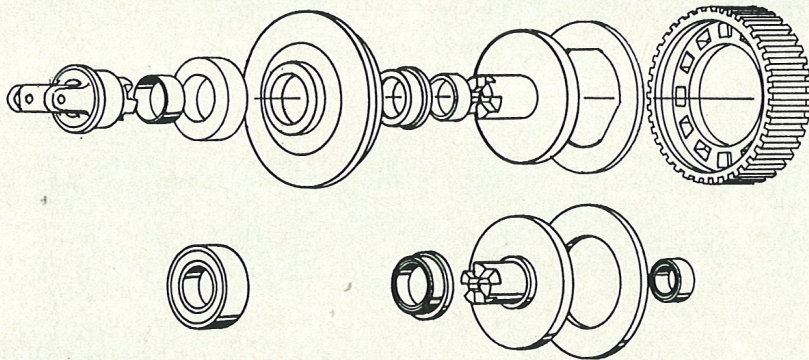
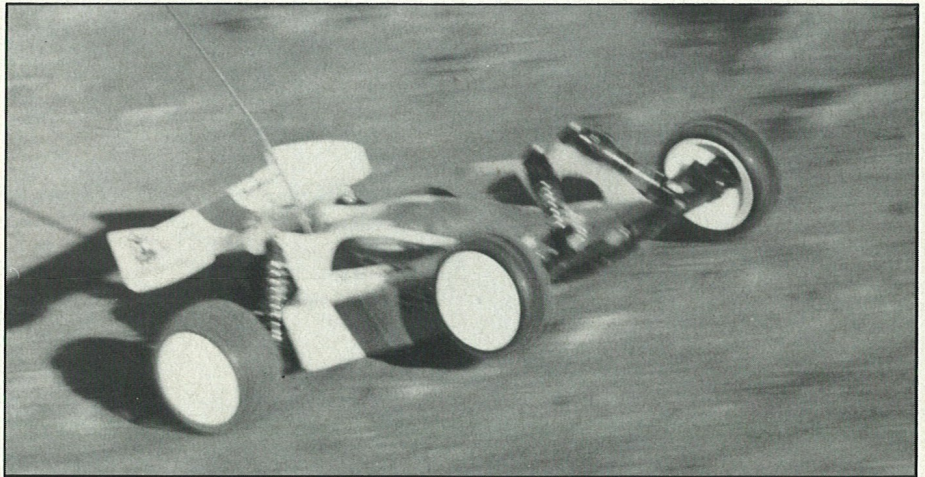
The new Cougar II differential is really well designed, both in terms of diff action and torque handling. The new diff now uses 14 balls (tungsten carbide on the Team car) on a diameter of 23mm to give a super smooth no-slip action. Side fences clip into each side of the parallel cut pulley, which helps belt alignment, which could be a problem with the old domed pulley. The side fences run in bearings (Team and Racing car) or bushes (Sport) which sit exactly



next to the main axle bearings. Loads are therefore transmitted directly to the main axle bearings which sit in the new eccentric housings.

To further aid the rigidity of the rear axle the washer carriers come in male and female parts. They mate in the middle of the differential, where the pulley runs, which gives an effective rear axle diameter of around 6mm. This huge diameter axle together with the ballraced side fences and new eccentrics make the Cougar II diff capable of handling enormous amounts of torque, unlike the drum diffs which run on wimpy 1/8in. axles.

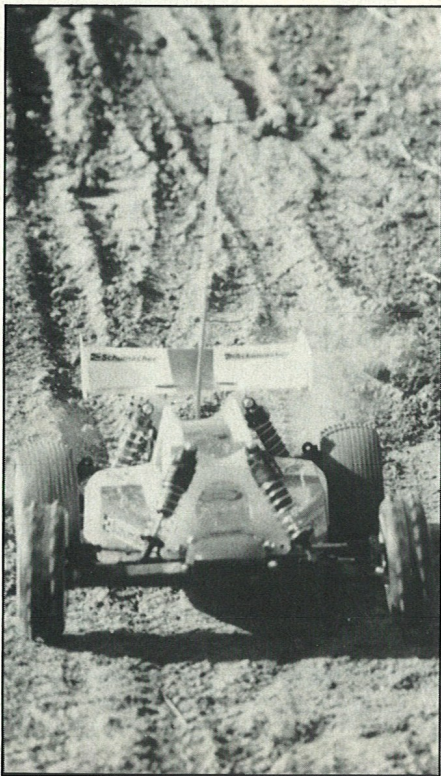
This transmission must now rate as one of the best 2WD transmissions on the market. There will be no need for replacement diffs in this gearbox.



The roller driveshafts give better drive over very bumpy circuits, and obviously much greater efficiency. The much cheaper alternative is throttle control over the bumps!

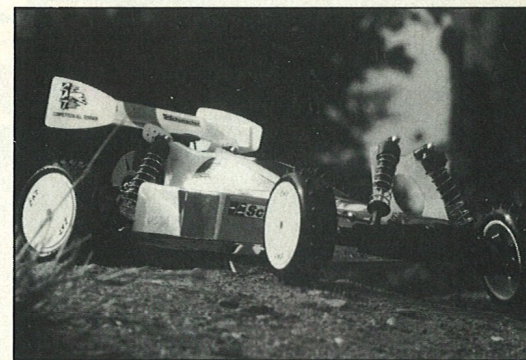
Conclusion

Other than a personal dislike for the bodyshell, there is very little I can fault the Cougar II for. Schumacher have addressed every detail and have produced a superb car. The range of models allows any pocket to enter the gang of already happy Cougar drivers.



The host of suspension adjustments make the car tunable to any circuit and for any driver style. Therefore, patience, testing and reference to the guide in the manual will give you a very fast car which suits you, and the track. Start with your know suspension settings or those in the manual, then with reference to the manual make alterations to dial the car to your driving style on the track.

The Cougar II is extremely quick, that goes without saying, with all the state-of-the-art features. The tyres are ideal for hard packed dirt or very short dry grass.



Track Test

We at Radio Race Car have fortunately been able to run many of the new Cougar II suspension mods for a few weeks now. The new front suspension geometry gives the car more steering with greater 'feel', which is often advantageous.

Cougar II

Features

New front 'A' arms
 Varimount front shock tower
 Varimount rear shock mounts
 Varimount new top link
 New shock absorbers
 Differential
 14 ball 23mm dia.
 Sealed thrust race
 Ballraced
 Alloy carriers
 Tungsten carbide balls (4)
 New eccentric housings
 New slipper clutch
 'Whisper' gears
 New wing mounts
 New 2.2in. aerodisc wheels
 Anodised red chassis
 Roller driveshafts
 Ballraced steering
 New bodyshell
 10 sealed ballraces
 Bronze bushes throughout

Sport

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