..PB PHOENIX....THE NEW ORDER...

Model Cars takes a look at P.B. Racing's latest winner

1988 has seen the introduction of two new exciting circuit cars. The *Serpent* 'Sprint'and the *PB* 'Phoenix' which supersedes the 'Nova X5'.

PB had a slightly uncharacteristic 1987 season with only limited success during the development of the 'Phoenix', but with the hard work of Paul Pagdin of *PB* and the *PB* team the 1988 specification car has so far proved successful.

What the aims were

The 'Phoenix' was designed to accomplish more than just the task of handling well and being strong. *PB* set out to make a car with a minimum of parts which would be easy to work on – and the chassis shows this in its simple neat design. The car was also to be cheap – this it accomplishes with the cheapest retail price of all the currently available circuit cars – and reflects this in the prices of the spare parts.

Also the main piece of engineering development which has been carried out on the 'Phoenix' is the long awaited ball diff – this was desperately required as the consensus of opinion was that this was a main area in which the 'X5' failed.

The specification

Apart from the essential ball diff (which by the way is excellent) the 'Phoenix' has a pretty impressive specification.

The car has a long single high strength belt which transmits the drive to the front from the layshaft, this is suitably kept in check by a neat tensioner. The car has a wide (14mm) rear drive belt from the layshaft to the rear diff – both these belts have proven very reliable.

The suspension has numerous adjustments from ride height to castor and enables the car to be tuned to suit various circuits.

The dampers on the rear of the car are the standard short *PB* plastic bodied items but on the front all new constant volume aluminium shocks are used which work very well.

A two speed gearbox is included which is the norm and this is the same unit as used in the 'Nova' and 'Mustang X3' kits.

The kit also includes one-way front rollers, high quality ballraces, quick release wheels, adjustable body mounts, servo saver and virtually all the parts required less engine and radio.

Construction

The best way to start building the 'Phoenix' is to read the instructions through before starting, just to get used to the part names – then have a look at the bags of parts to familiarise yourself with the parts so that there is no confusion with knowing what bits are what.

The first section of the instruction suggests that the tyres should be glued to the wheels – this is a good point as they do take 24 hours to cure and if you have all the parts – the car itself took me around 8 hours to complete. This situation means that you end up with a completed car ready to go with no wheels – how annoying.

First for building is the rear differential, this is probably the trickiest part for assembly as it contains lots of parts which are not easy to identify – but read the instructions carefully and de-burr the parts correctly and eventually the diff comes together to form a very smooth action. The diff adjustment can be altered when in the car via a special spanner, available from *PB* (part no. 16/430) although I would advise setting the diff really quite tight initially because after the first run it soon frees off and requires tightening.

Next comes assembly of the two nicest looking parts of the car – the rear sideplates. These are beautifully machined from high quality alloy and form a very solid mounting for the rear suspension. To these sideplates the rear suspension arms are bolted via small roll pins and 3mm Allen bolts. The instructions specify that the suspension arms should be free enough to fall under their own weight – this does not occur unless the arms are de-burred and cleaned out. To do this, under no circumstances use a file – this will only cause an unround hole and will cause unnecessary wear on the arms. What is required is a 3 and 4mm reamer – these are expensive (around £7) but do the job well for both the front and rear arms and will last for ever.

After getting all the arms free on the pins the other parts required are bolted to the sideplates. This is an idler gear for the drive belt and the brake pads which need to be carefully de-burred.

Front suspension

The main area for concentration on the front suspension is getting the arms to move freely on the pivot pins. This again is where the 4mm reamer comes in. I suppose a 4.1mm drill would do a similar job but who's got a 4.1mm drill to hand? Once the arms are cleared out bolting the front suspension together is simple. The transaxle drive square must be Loctited onto the shaft and small spaced fitted before the one-way drive cups are placed on the shaft. Before all this is completed the front suspension springs must be fitted, these slip in easily and are adjusted by 3mm grub screws.

The instructions do not actually tell you to do this although the photographs in the instructions make it quite clear.

Now the front gearbox and the rear side plates are complete they are bolted on to the chassis. Don't forget to place in the rear diff between the side plates and to fit both drive belts – as they are impossible to fit afterwards.

When both sections are bolted to the chassis the car actually starts to look right – at this point the tensioner is fitted which keeps the main drive belt taut. In the instructions the 'lip' on the tensioner pulley is fitted towards the mounting plate – this seems OK but during running the belt can fall off. This is easily cured by turning round the pulley so the lip keeps the belt from moving.

Next up comes the layshaft, this fits into the side plates and transfers the drive from the main gears via the belt to the rear diff. It carries the brake disc and drive gear which both need securely Loctiting.

The brake disc itself requires some attention. The inside needs to be cleaned up so that it is free on its carrier, then it needs to be coated in cyanoacrylate to toughen up the outside and inside edges – this improves the life of the brake disc.

The brake cam and shaft come next – the actual 'cam' is in fact a 3mm Allen bolt which needs to be ground to the correct shape. *PB* supply a neat diagram and this causes no real problems – although make sure you Loctite this bolt properly.

Up Front

The front axle assembly blocks need putting together before bolting to the suspension arms. These blocks contain the ball-races and drive cups. The drive pin which goes through the cup and locates on the wheel needs to be positioned firmly. This is done by flattening one end of the pin and Loctiting in place.

When the axle blocks are fitted to the car slip in the front drive shaft – make sure nothing binds and that the steering is easy. If this is not the case pinch the suspension arms around the pivot ball – this immediately frees it off.

The front anti-roll bar needs fitting next, this is very simple although make sure the ball and socket are central on the wire.

The rear axle blocks need the bearings pushed home – this is made easier if a scalpel blade is run round the plastic lip to create an angle for the bearing to start going in. When this is done the drive cup is fitted. The quick release mechanism is fitted to the end of the cup. These can cause problems but if fitted correctly and bent at a slight angle, work OK. *PB* do now offer an alternative quick release system which is very neat but not really necessary.

Radio Fitting

The radio tray on the 'Phoenix' is neatly milled out from a black plastic which seems quite tough and light. Servo fitting is helped by *PB* leaving a hole which fits most servos although the fixing is left to the builders. I used tie-wraps through 3mm holes which so far has given no trouble. Receiver and battery pack are hung from a mounted plastic strap – this is all very simple. *PB* include their own bolt on servo saver, moulded in black plastic it looks great and works very well – believe me the servo stays in one piece after horrendous accidents (ooops!)

Once the radio tray is bolted to the car the chassis feels extremely tough. One of the radio tray mounts doubles as the roll bar (better as a carrying handle) fixing – this sits into two holes in the chassis and is extremely strong.

Next up come the shock

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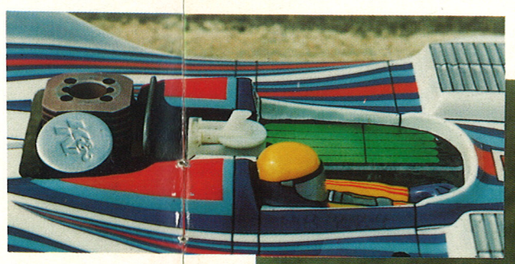

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absorbers. The rear set at the standard short *PB* items as used on the 'Nova' and 'Maxima' 1/10th car. These require a little work on the pistons to create a smooth movement but, spend the time as, when properly assembled, the dampers work very smoothly. The front has one-way constant volume aluminium dampers. These are beautifully machined and if assembled as per instructions give a very smooth constant action which, although when fitted to the car, seem to do very little, but actually do – just try the car without them.

Engine fitting

The 'Phoenix' is supplied with engine blocks which require drilling and taping to suit your engines. This I got round by ordering a set of the excellent pre-drilled engine mounts to fit my *Nova Rossi* along with the correct manifold – this makes the whole task very easy indeed.

The clutch needs to be trimmed and fitted to the flywheel and then bolted to the engine – use a good quality Loctite to stop this coming loose.

Fit a good air-filter, *PB* do the *K&N* type which seems to be the most popular. The tuned pipe fitting is left to the builder – I used an *OPS* plastic mount

set although a simple piano wire link would do.

PB's '2 speed' gearbox is included in the kit. This needs to be properly cleaned up and de-burred if it is going to work properly.

Make sure the shoes are free on the bolts that adjust them and use a good quality Loctite – as if you don't the box will continually alter itself.

As for adjustment, only alter both adjustment screws the same amount – stick to this rule and no problems should be found. Be careful to set the gearmesh with very little play at first as the gears do run-in. All that remains to be fitted is the fuel tank, fuel lines, front bumper and wheels and tyres and the chassis is complete.

Let's Get Going

The bodyshell supplied in the 'Phoenix' kit is the 'Porsche 917' – this looks very good but apparently "those who know" say that it doesn't handle as well as some of the latest shells. So an *SG* 'Lola' was fitted for racing (I still prefer the look of the Porsche!) The wing is supplied with mounting kit and bolts to the rear axle blocks – therefore pushing the tyre onto the ground, not the suspension.

On The Circuit

The Model Cars 'Phoenix' was taken to the Tibshelf BRCA National. Now, with a kit review like this, it is very difficult to say whether a car is good or not but the following facts must say something about the performance of the 'Phoenix' in what are still early days. Tibshelf was to be a three day meeting: saloon, F1 and Sports GT. Now it must be remembered that this was the 'Phoenix's' first run and that I have never before driven a circuit car, although through Rallycross am quite familiar with i.c. engines.

On the first day (Saloon) the first two heats were used to set the car up – a very low ride-height is required (about 8mm) on the front also quite heavy damping at the rear.

The diff has to be quite stiff otherwise power is lost. The two speed gearbox needs some setting but once correct stays that way.

At the end of the day the car was fastest in its class (Group C and 24th overall – not bad with over 70 entries.

In the final the car ran reliably to a maiden victory – and I couldn't wait for day two F1.

Rain and more rain – the *PB* – only on its second use – was going to get wet. The super *MRC* wets were glued to the rims and fitted to the car and in heat 1 an overall time of tenth fastest. I'm afraid during the next two heats a chunked tyre and probably bad driving caused a drop to 14th overall – but another FTD in class and eventually another 'C' group win.

What must be said is that on the first two days the open final contained no less than five 'Phoenix's' this obviously says somethng about whether the car is competitive enough or not.

On day three the Model Cars' 'Phoenix' and driver were determined to go all out in an attempt to make the open – new tyres borrowed, 'Lola' bodyshell and a good clean up and check over commenced before heat 1.

After round 1 success! (4th fastest overall) but again during the day the disadvantage of being in an early heat with too many back markers took its toll and in eighth position I eagerly awaited the last heat of the last round of the day – in this heat was one Chris White – who inevitably knocked me out to ninth position – but to prove the'Phoenix's'pace there were six of the cars in the open final.

So yet another 'C' final but not a win, a throttle servo decided to stop working (Damn nearly a hatrick).

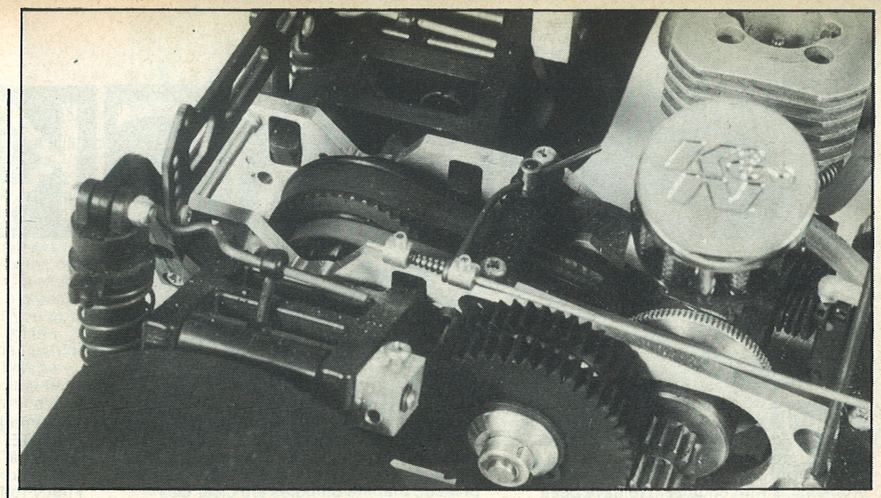
Conclusions

The 'Phoenix' has proven to be the car to beat in 1988 so far – with numerous FTD's and a handful of wins it is obvious that the 'Phoenix' is now to carry on *PB*'s reputation at the top.

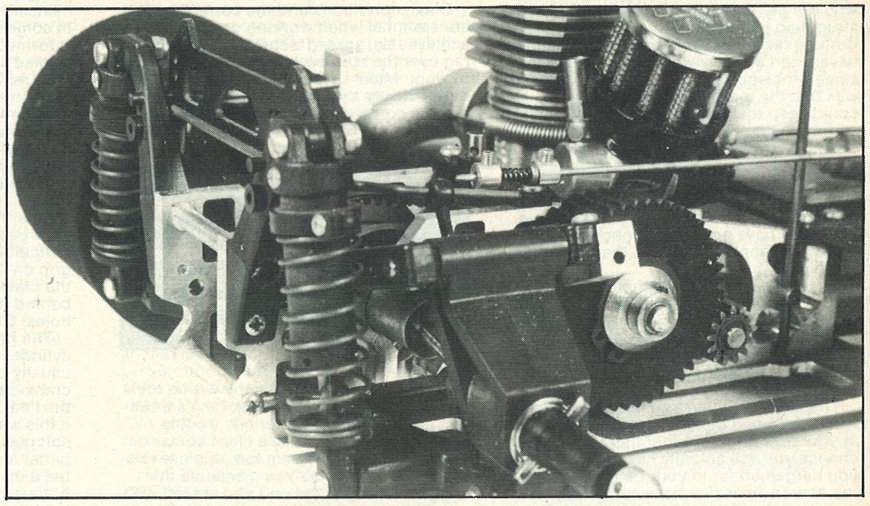
The car is cheap, reliable and easy to build and drive – the spares back-up is excellent from *PB* and at trackside – this coupled to the *PB* team's very helpful attitude I feel makes for a very hard package to beat.

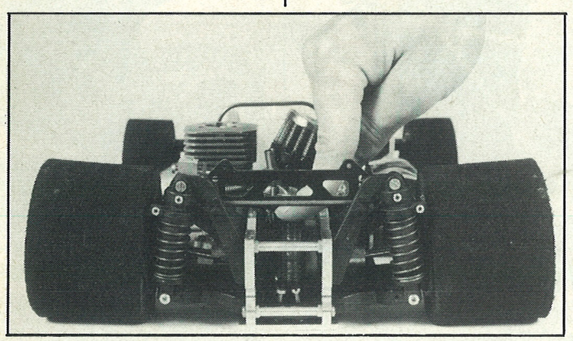
Well done to Paul and the team and let's hope for the continual success of the 'Phoenix' for the rest of the season.

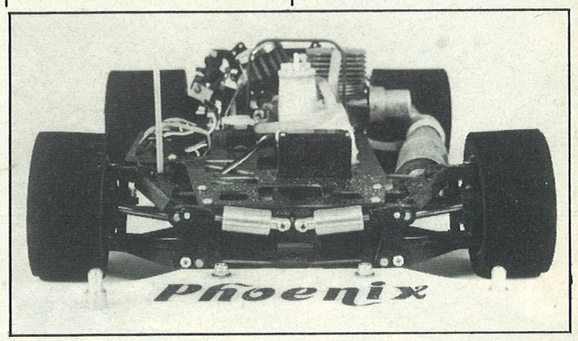
Available from: PB Racing Products, Downley Road, Havant. Tel: 0705 471 774. Price £295.00.



Above: The PB 2 speed gearbox sits snugly up against the clutch drum – the two drive belts can also be seen.
Below: PB rear dampers are moulded in black plastic – note adjustable anti-roll bar position.







Below: Rear end has camber change built in as suspension is depressed. The front dampers lie flat and are compressed via black fibre plates.