

# Back on Track!

The Phoenix will be back with a vengeance in 1991 - according to John Glazbrooke

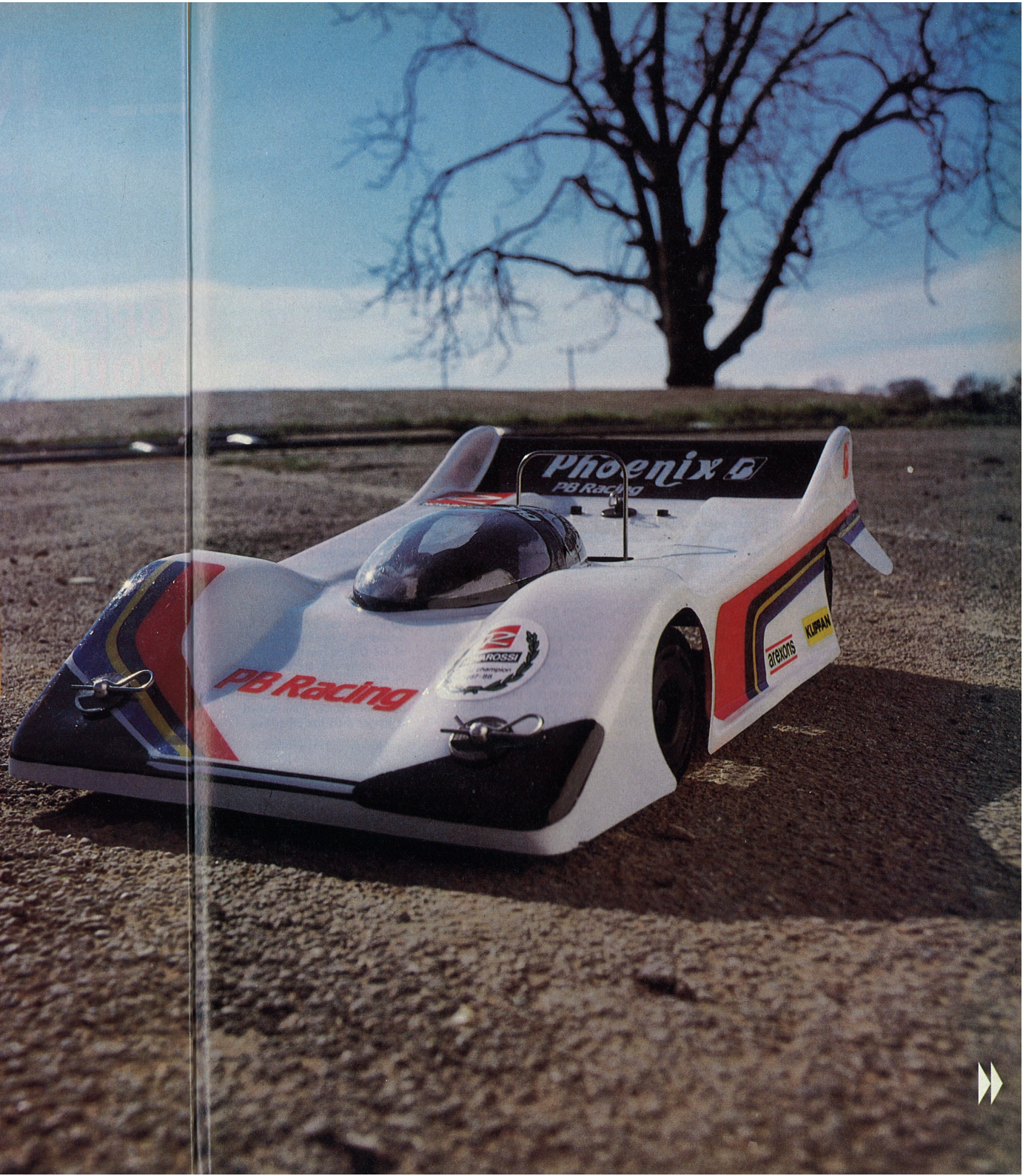
You only have to look at the impressive driver line-up ranging from "Open" through to "C" Group Drivers, such as notable drivers as Dave Dixon, Chris White, Bai Panesar, Mark Green, Neil Woodhead, Dave Ashton, Gareth (Ding Dong) Bell, (Leaping) Frank Chung, Steve Hart - the list goes on and on.

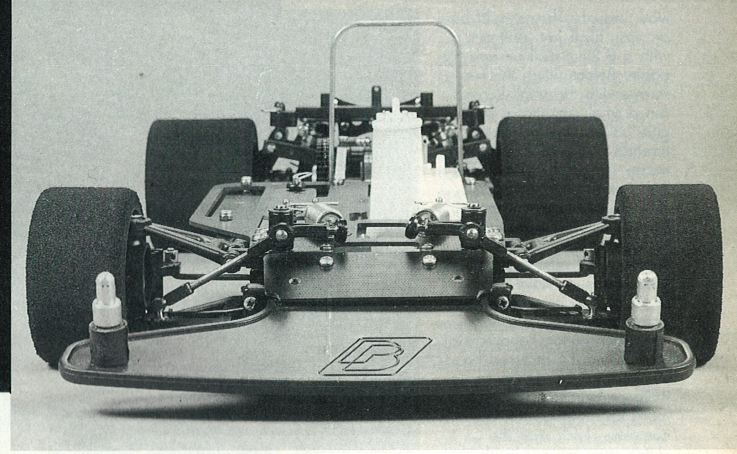
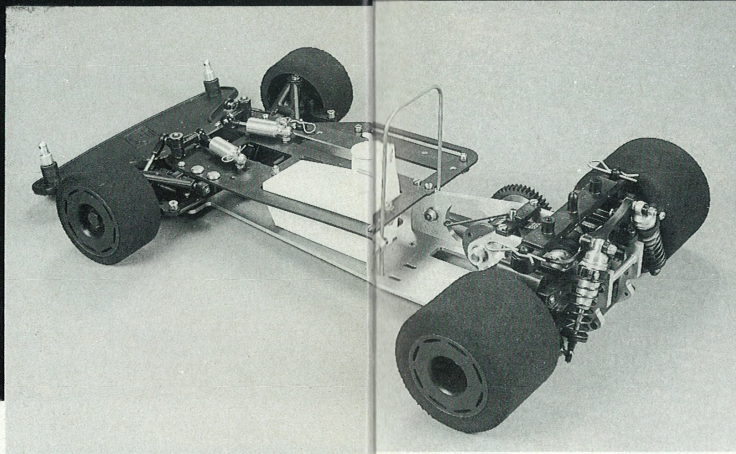
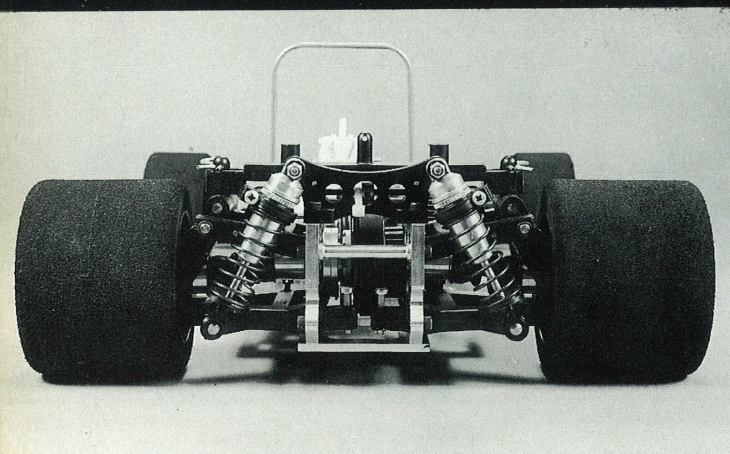
When Keith Plested decided to hang up his circuit drivers hat and concentrate on developing a 1/8th Rallycross car, the progress of the circuit car seemed to take a step backwards. Steve White was lost to Serpent, along with Gary Culver. This was a major blow to P.B. but they soldiered on. There were some successes but Keith had to rely on feed back from his team drivers.

Then the Phoenix was born and the future was starting to look brighter. Dave Dixon was asked to drive for P.B. in 1988, and started setting FTD's at most of the circuits around the Country. But the cars lacked reliability. Then in mid-1989 Keith Plested made a come-back to driving circuit cars and development started in earnest. There were gradual and sometimes radical changes made and in mid-1990 the Phoenix started to win races, not only in open finals in the hands of long time driver Chris white but wins were being made in "A", "B" and "C" Group finals. Development continued throughout 1990 culminating in the car reviewed here, the 1991 Phoenix 4WD.

## Finer Points

I am not going to go through the step by step build up of





the kit, because the instructions (which are as good if not better than some of the Japanese Manufacturers) do this better than I.

The kit can almost be built from the very clear photographs, but the instructions are also very clear and easy to understand, taking the newcomer through all steps of construction, right through to the completed car. The only advice I would give the potential buyer of the kit, is to read the instructions carefully and start the build up from step one through to final assembly. Don't be tempted to skip through the pages, and above all, don't open any of the pre-packed

parts until you come to the part of the assembly that requires them. This way you won't lose any of the parts.

What I am going to do in this review is to guide some of the less experienced among you through some of the finer points of building and setting up the Phoenix.

The kit arrived in a surprisingly small box, The reason for this is, as in line with other 1/8th circuit manufacturers a body shell is not provided, but P.B. can supply a bodyshell of your choice from saloon through to the highly recommended Peugeot 905 Group "C" body shown in the pictures.

Start the construction by finding yourself a saucer. This

is to put the parts into from the packets you are going to open. You will also need the tools and Loctite recommended in the instructions and a small tube of super glue. The assembly starts with the Diff.

Careful assembly of this will pay dividends when running the car. Empty contents of the pack into your saucer. Take all metal parts except the two bearings and wash off in petrol or lighter fuel, this will get rid of any machine swarf and oil that may be present. Next take the large plastic centre diff moulding and carefully remove any moulding flash that may be present with a sharp knife, The reason for

this is so that you don't shred the drive belts and you will also have a smoother running car. Do this also to the drive belt flange. Now, also with a sharp knife, gently radius the outer edges of the holes that the twelve diff balls run in. Doing this will also remove any moulding flash.

Now into the twelve holes put a small blob of grease (I use L.M. Grease). Place in these holes the twelve large ball bearings. They will only go in from the left side of the moulding. Assemble the rest of the Diff as per the instructions with the exception of the L.H. drive cup carrier.

You will notice that one of the 3mm counter sunk screws is longer than the other two.

When fitting this screw do not use any Loctite here, and when you fit this you must ensure that the diff adjusting ring slot is lined up with the screw. If you do not do this you will strip the threads, so BE WARNED. Fit the two remaining screws with a smear of mild Loctite. These are not loosened for Diff adjustments. Fit the two bearings and put to one side.

#### Two Speed Gearbox

This unit will not be any problem to the experienced builder. Being the same as the Serpent and S.G. Gearbox. But, to someone who has never built a two speeder before the setting up can be a little confusing. It is

to the novice that I am going to explain an easier way of doing this essential initial setting up. Firstly build the gearbox as per the instructions but before you

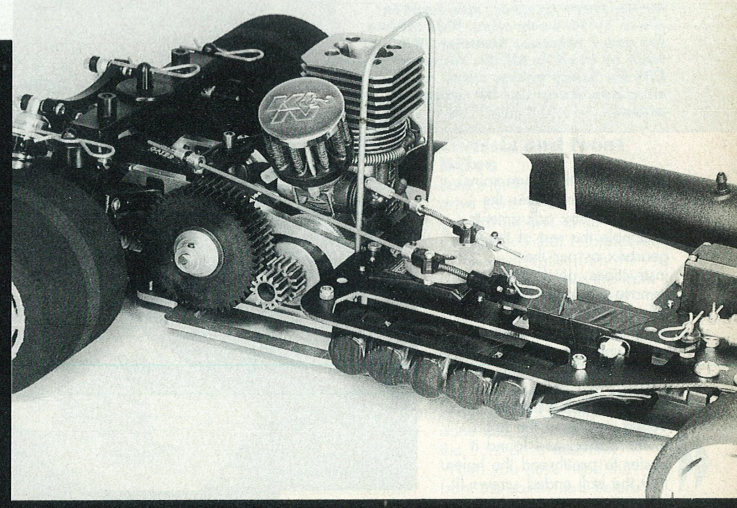
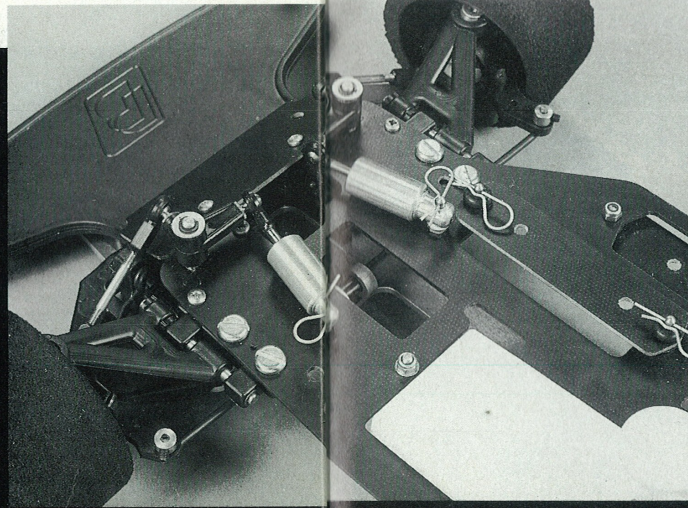
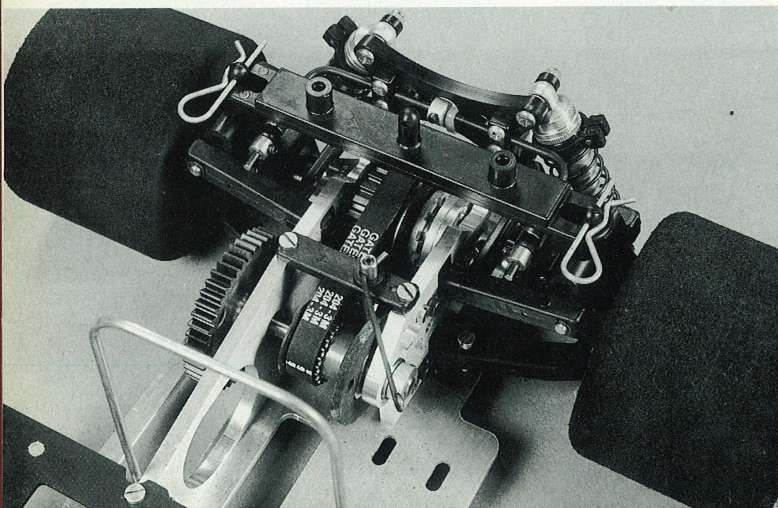
with your knife from the shoes. You will see on the bottom of the shoes a half round cut out with a hole in the middle. De burr this hole, but don't make it any bigger.

through the hole. Now screw in the 5mm x 8mm long grub screw until it just starts to push the ball bearing out of the bottom hole. Now observe where the head of the grub screw is. It should be slightly under flush with the top of the shoes. If it isn't remove it and grind or file off slightly more of the screw than protrudes from the top of the shoes. Refit the grub screws and paint each one with a light coloured paint. I use white for one and yellow for the other. This method eases identification when making adjustments. Now take the two 3mm x 16mm long button head screws and place them into each of the recessed holes. Push the screws all the

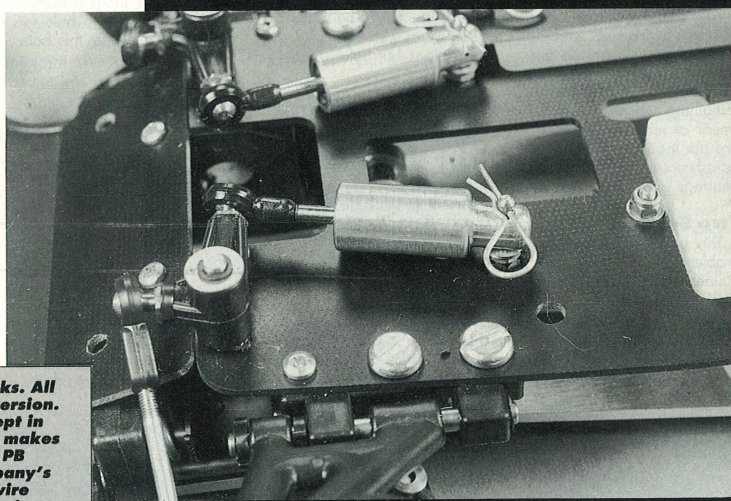
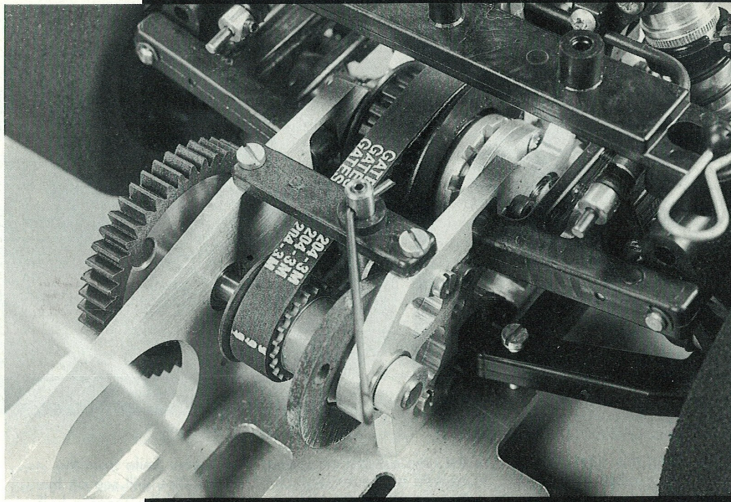
**Above; Studio shots of the 2WD version of the Phoenix show the neat rear end, simple radio tray layout and new smooth moulded front bumper. Bottom left; Rear body mount and disc brake lever. Front suspension using pushrods to operate dampers. Radio and engine installed, roll hoop saves engine head in event of accidents.**

assemble the gearbox clutch shoes there is a small amount of work to be done. Firstly remove any moulding flash

On the top centre of the shoes place a ball bearing, push this right to the bottom but not so that it protrudes



way through. They should be an easy fit. If not, drill out with a 3.2mm drill bit and try again. Before fitting the two screws with the small springs run a small amount of super glue all the way up the threads and wipe off any excess and allow to dry. The instructions tell you to use mild Loctite. I have never found this method to be satisfactory. The screws tend to loosen off after a couple of adjustments - I have found super glue to be more permanent. Place a spring over each button head screw and fit into the recessed holes of the clutch shoes, do up three or four turns, but no more at this stage. Fit the complete clutch over the clutch cam, but not inside the second gear carrier drum. Now screw down the button head screws until the bottom of the heads are just flush with the holes, now continue to screw these down a further nine complete turns. Again paint the holes with two light coloured paints, to aid adjustment identification. Now slide the completed clutch into the second gear carrier drum and rotate until the grub screw is in line with the hole. Take a 3mm allen key and screw down the grub screw until the shoes touch the drum. Now back off approximately 1/8th of

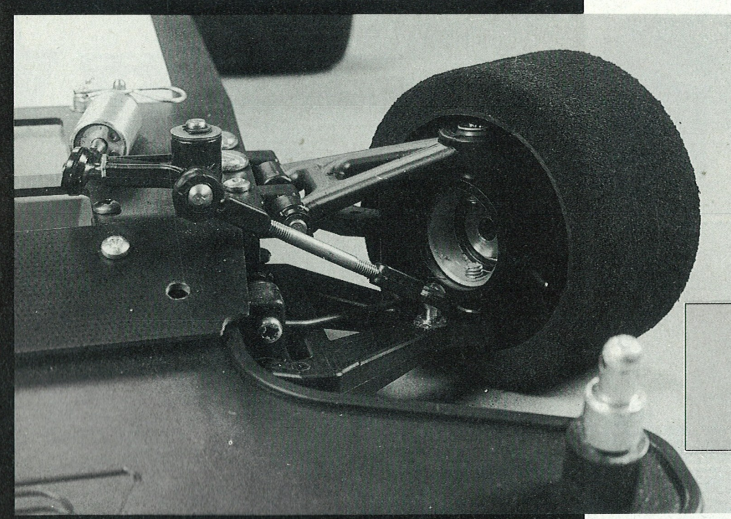
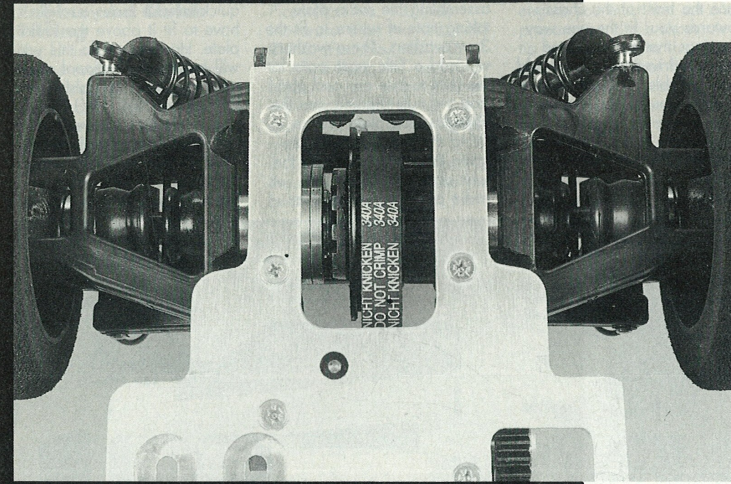
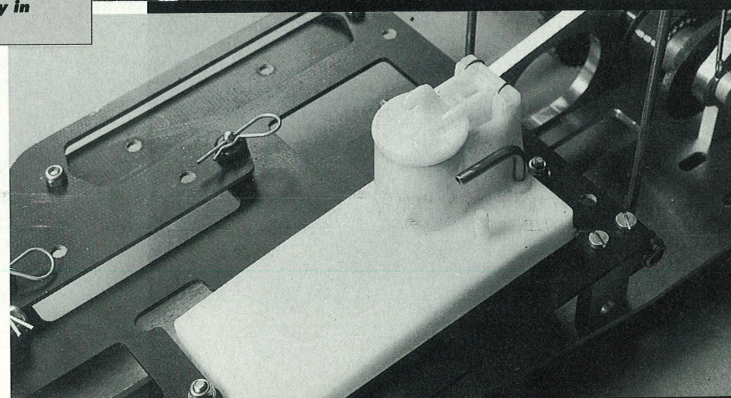


**Detail of the alloy rear blocks. All our photos show the 2WD version. Right; Front dampers are kept in place by PB body clips. This makes for quick release. Standard PB tank as used in all the company's kits for many years, small wire clips now keep the lid safely in place.**

turn or until the drum spins freely. This completes the initial gearbox adjustments. Assemble the rest of the gearbox as per the instructions, not forgetting to remove any moulding flash from the two plastic gears. Put the completed gearbox aside until required at a later stage.

#### Rear Wishbones

When preparing the two lower wishbones I found it easier to pre-thread the holes that the ball ended screws fit



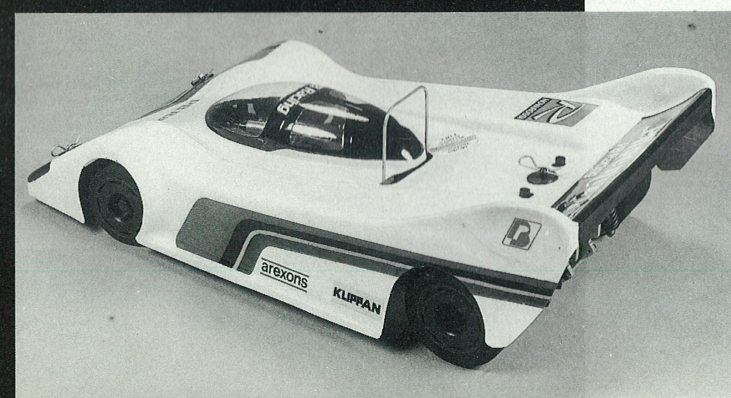
into. If you haven't got a 3mm tap you can use a 3mm allen cap screw to do the job. Fit the ball ended screws in about half way and then put a dab of super glue on the exposed thread and quickly screw in up to the flange. Before fitting the upper wishbones make sure you have removed plastic from the centre of both lower inner webbs of the top wishbones. The instructions show you how to do this work which is necessary to give clearance to the inner diff drive cups. If you don't do this work you won't get any rear suspension travel, and you could also damage the rear drive train. Assemble all the wishbones as per the instructions into the long and short sideplates. Fit both drive belts to you pre-assembled diff, making sure that you fit the short black belt to the larger diameter grooved pulley, and the long red belt to the smaller grooved pulley. Fit the whole assembly to the rear of the chassis using mild Loctite on the 3mm counter sunk screws. Prepare the brake disc as per the instructions. Fit into the previously fitted brake pads. Fit disc driver and rear drive belt pulley. Now fit the two speed gearbox. Grind the two

**Top; Rear wishbones are smoothly finished and have good strong mountings for the dampers. Left; Front wishbones are slim yet tough, the front has a very neat appearance.**

grub screws to a flat bottom. This will give them more area to bite on. Fit using mild Loctite and screw up tightly.

#### Chassis and Front Drive

Before fitting any of the front drive parts to the chassis, I carried out one small modification that I considered to be worthwhile. Turn the chassis over so that the front bottom is facing you and either file or grind an angle back to the front counter sunk holes. This will stop the chassis digging into the track when running the car low or under heavy braking. Having done this, proceed with fitting the front drive assembly. When you have fitted the front transaxle, and before



final tightening of the drive flange grub screw, ensure that you have equal amounts of shaft protruding from the left and right of the axle support bearings. If not, adjust until you have. Proceed with the rest of the front end assembly as per the instructions.

When fitting the top and bottom aluminium king pin balls to the wishbones make sure that in the top you have the counter sunk side of the pivot balls facing upwards and in the lower wishbones that they are facing downwards. If you fail to do this correctly the pivot screws will grind themselves into the wheel hubs. If you have a kit that has front "UJ's" read very carefully the procedure for adjusting the drive shaft length. If you set the driveshafts too long you will restrict the front suspension movement and cause damage to the drivecups. One other thing that I should have mentioned earlier, and this is aimed at those of you who have had no experience of one way roller bearings, the easiest way of telling which way they should rotate is to

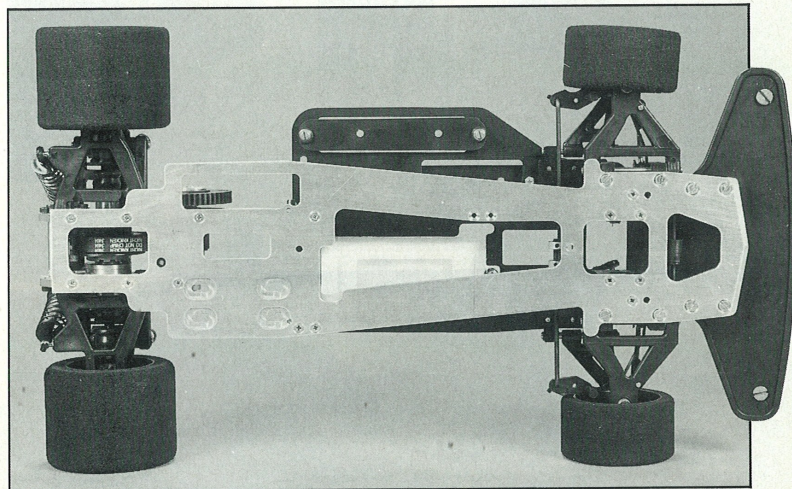
face the front of the chassis towards you; fit the one way bearings that are pre-fitted into the drivecups. You should now be able to rotate them towards you. If not, change them over - easy isn't it!

### Radio Plate and Tank

Refer to the instructions on

assembling the radio plate, taking note of where to fit the 3mm washers. These washers will add a little more area for the nuts to bite on, and also stop the nuts digging into the fibreglass top plate. When fitting the fuel tank, you are given the option of fitting the tank above or below the radio plate. If you want a

quick release tank you will have to fit it above the radio plate. However to do this you will require the optional quick mounting post (available from P.B. as part No. 15/104). If you fit the tank above you will raise the centre of gravity which will very slightly impair the high speed cornering of the car. The choice is yours.



### Engine and Clutch Fitting

The kit is supplied with engine mounting blocks that have threaded holes for the chassis bolts, but does not have the holes drilled for the engine. This is because the position of these holes differ from one make of engine to another. Optional mounts are available from P.B. for the following engines;

Picco (Part No. 13/146)  
Novarossi (Part No. 13/147)  
O.P.S. (Part No. 13/148)

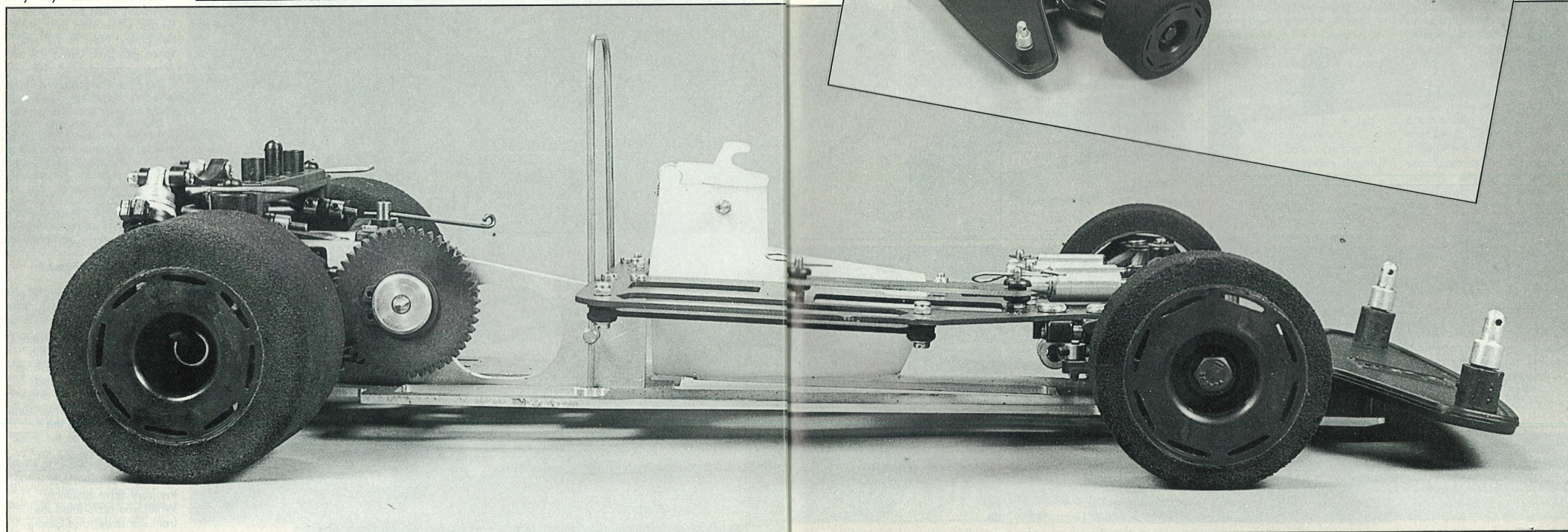
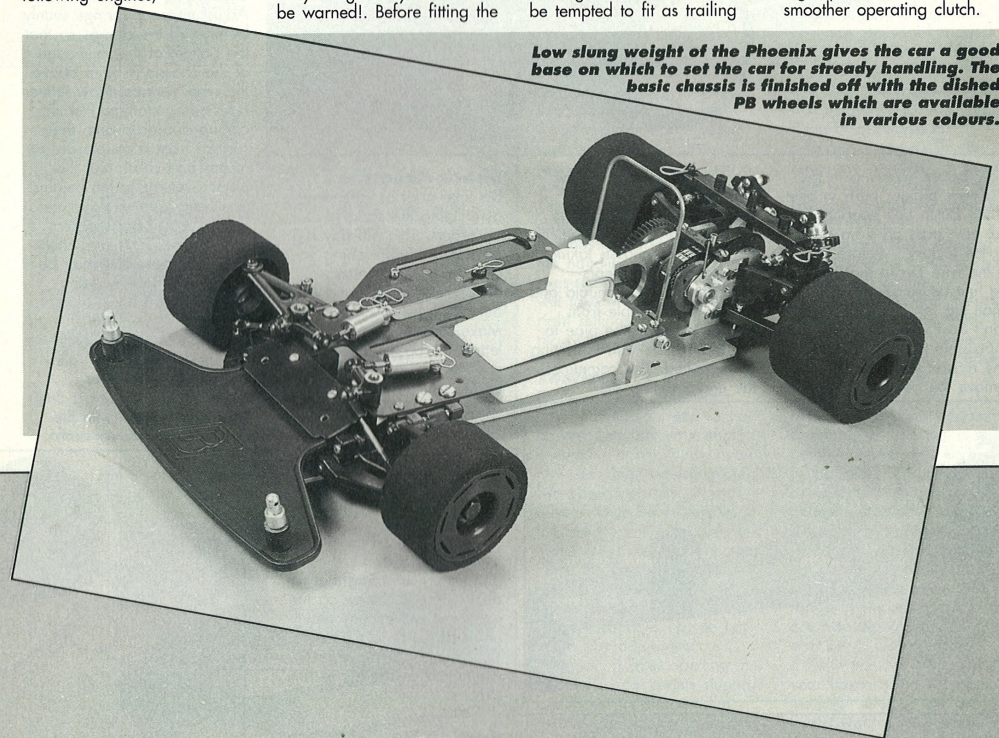
When fitting the mounting blocks to your motor it is very important to fit the two spacers on top of the blocks and under the engine mounting lugs. If you don't the clutch bell will rub on the bottom of the cut-out in the side plate. You will then have alloy filings everywhere - so be warned!. Before fitting the

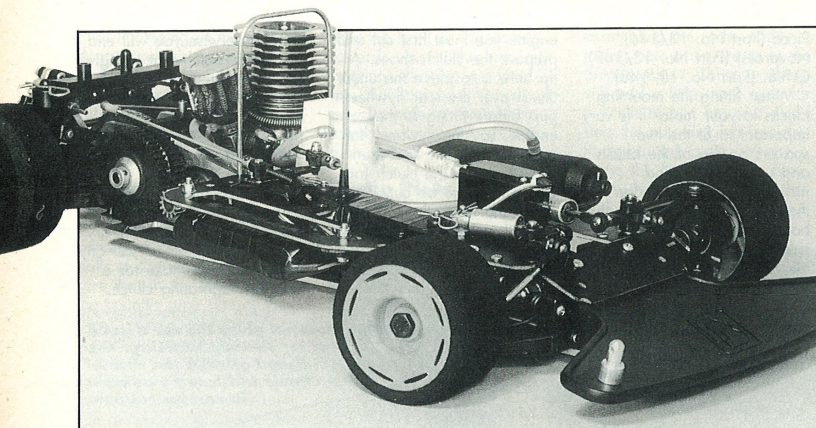
engine you must first cut and prepare the clutch shoes. A tip here is to place the uncut clutch over the four flywheel pins before fitting to the engine. Lay the flywheel flat on a work surface and then draw lines on the clutch face where it has to be cut. Please follow the instructions carefully before doing this work. Also note that this is a leading shoe clutch - don't be tempted to fit as trailing

shoes otherwise you will end up with a clutch that will give excessive slip. The flywheel can now be fitted, ensuring that you screw the flywheel nut tightly.

You can now fit the clutch shoes, following the instructions carefully. Before fitting the clutch bell polish the inside with 200 Wet/dry paper. This will knock off any high spots and make for a smoother operating clutch.

**Low slung weight of the Phoenix gives the car a good base on which to set the car for steady handling. The basic chassis is finished off with the dished PB wheels which are available in various colours.**





Now before screwing in the first gear pinion, push in one of the clutch bell bearings. I will now pass on a tip given by the factory – before you fit the wire circlip that retains the first bearings, bend a small lug into the clip. If you don't do this it will be impossible to remove it if for any reason you need to remove the bearing. Now fit

the second bearing. Fit the first gear pinion and assemble using the spacers for your particular engine. Fit engine to the chassis taking care to mesh the gears correctly. Fit the manifold and pipe (also available from P.B.) and secure the pipe to the radio plate with the fitting pin supplied. This completes the engine fitting.

### Shock Absorbers

Do take a lot of care when assembling the shock absorbers. This will pay big dividends when running your car. Open all necessary packets. De-grease and clean out all of the shocker bodies. Make sure there is no swarf left in the bodies otherwise this could score the shocker bodies and ruin the seals. Make sure you polish the shafts with 600 Wet/dry papers – this will remove any high spots. When fitting the pistons to the rear shock shafts fit so that the flat part of the pistons are at the top, slowly fill with oil as recommended in the instructions, ensuring that no air is trapped. Screw on the caps and test for any air. If all is alright fit to the car. You should now have an assembled and ready to run car.

### Setting Up

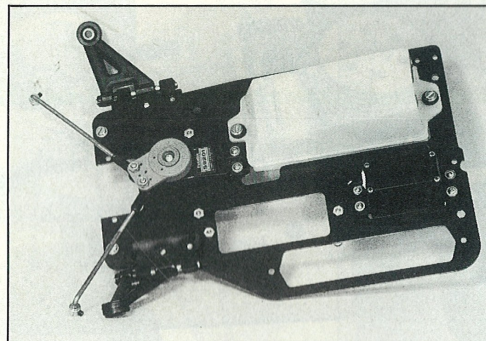
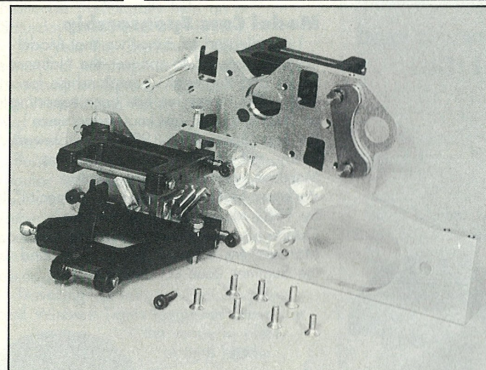
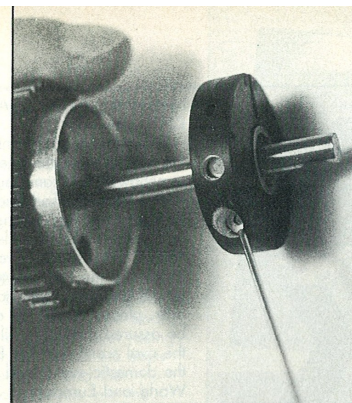
If you have built your car correctly this very important setting up procedure won't take very long. After setting up your car, it will run as though on rails, assuming of course that you have fitted the correct tyre combinations. The first thing to do is to find a flat level surface then remove all the wheels from the car. Place the car on your surface and adjust the front downstops until you have a gap of 1mm under each wishbone. For the next stage you must ensure that all the tyres are of the same diameter as recommended in the instructions. This is very important to get all the adjustments equal. Disconnect

the front and rear anti-roll bars and front shockers. Adjust the front suspension springs with a 2mm allen key. These are accessible through the holes in the bottom of the chassis. Do this evenly for both sides until the bottom of the chassis at the front edge has a natural height of 6mm above the work surface. Now turn your attention to the rear shocks. Adjust the rear springs evenly by moving the clamps to the bottom of the rear edge of the chassis is 8mm above the work surface. Now tighten rear spring clamps. Pick the car up and drop onto the surface from a couple of inches and check that the chassis returns to the heights you have just set. If not, re-adjust, re-fit front shockers and anti-roll bars and check for any tweaks that may be present. Refit all wheels except the left hand rear.

### Adjusting the Diff

On the left hand rear alloy sideplate by the inner drivecup you will see a 5mm hole. Line this up with the longest 3mm counter sunk

*The two speed gearbox shoes marked to help with adjustment. Centre; The alloy rear end of the car and the radio tray. Bottom; Lining up of the diff to make adjustments.*



screw and undo it until it just clears the slot in the diff adjuster ring, further undo this screw so that it protrudes into the access hole. Now adjust the castellated adjusting ring with the "C" spanner provided. This should be turned towards the diff and should be fairly tight, but don't overdo it. Tighten the 3mm counter sunk screw, ensuring that it locates into a slot in the castellated ring. Refit the left hand wheel. Now hold both rear wheels and with your thumb try to turn the outer gear forwards. If you can (without extreme force) the diff is too loose and will need re-tightening. Repeat the procedure until you can't turn the outer gear. The diff is now set, but different settings on the diff will have different effects on the handling of the car i.e; over-steer and under-steer. It will take practice to find the right settings. Your car is now ready for track testing.

### Testing

Once satisfied that the car runs in a straight line (under power) and that your engine is running correctly, you can now set about adjusting the two speed gearbox. If you have followed my previous instructions this only takes a matter of a couple of minutes. Place the car on the straight, open the throttle to full power. If after about six yards it changes up, do not make any adjustments. However, if after opening the throttle the car seems sluggish and does not change, the gearbox is already in second gear and must be adjusted. To do this stop the engine, hold the gears and turn one

wheel until one of the button head screws lines up with the hole in the top of the gearbox. Turn the button head screw in one and a half complete turns. Again hold the gears and turn the wheel until the other button head screw appears and adjust this by the same amount. Try the car again. If it still does not change, repeat the process until you are happy with the gearchange. Perhaps now you can see why I suggest painting the screws different light colours.

I hope this review has been informative to all you P.B. Phoenix owners and prospective buyers. If you have any problems at track side I will be happy to help. Likewise any of the other P.B. Team Drivers.

In the course of building the Phoenix kit I did not have to file, drill or modify anything, other than the small modifications I suggested. The kit is beautifully engineered and all parts were a perfect fit. Well done P.B.

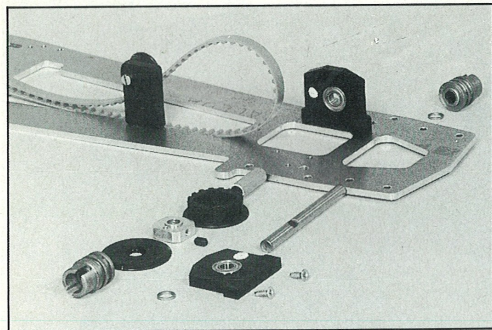
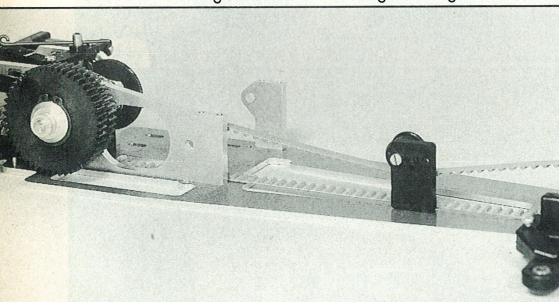
It has always been P.B.'s policy to carry out ongoing development and this is still going on, even this early on in the year. Currently under development is a three speed gearbox (Yes, three speed!!). Stronger front lower wishbones with more glass in the plastic will be available by the time you read this. A range of silicone shock oils are also being tested and will also be available shortly.

Keith tells me that sales this year have so far outstripped the total sales of last year so if you want a kit it would be wise to get your order in now.

The price of the kit reviewed here is £295.00 A two wheel drive version is available for £243.73 This kit can be upgraded to full four wheel drive specification as reviewed here. The kits are also available as a single speed version or with a solid rear axle Conversion kits are available to convert your Phoenix '90 to full 1991 specification. The cost of this is £75.99

P.B. are also able to sell all of the above as engine kit deals with a choice of various specifications of Novarossi or the Picco engines.

Phone P.B. Racing on 0705 492310 and ask for prices.



*The long drive belt placed in position during assembly. The front transaxle in various pieces. Right; The wire clip which holds the clutch bearings in place.*

