

RB5 MID CUSTOM SPECIAL - INSTRUCTIONS MANUAL

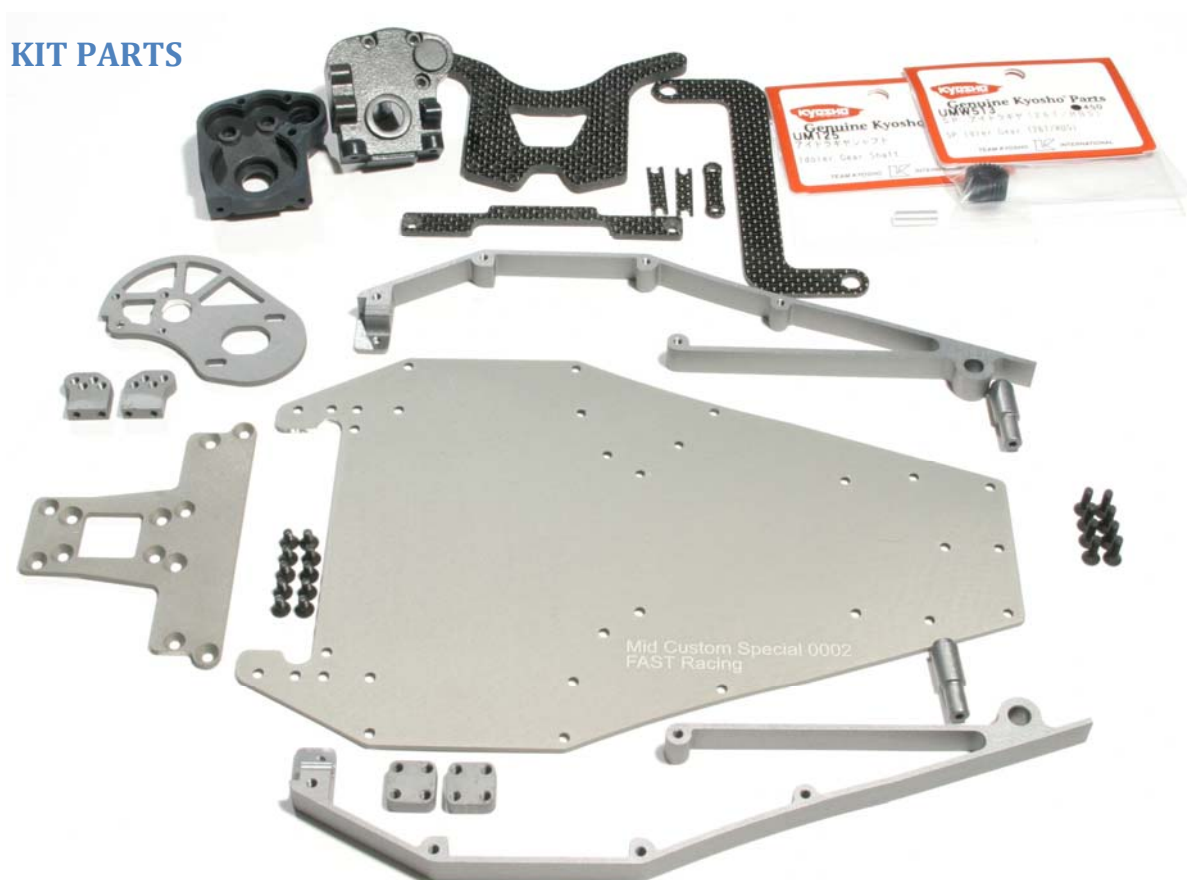
INTRODUCTION

This manual is intended to the few people who were lucky enough to get their hands on a Mid Custom Special conversion for the Kyosho RB5. Due to the very small production volume of the car, it has been decided to do a step by step build using a new kit, rather than to use CAD pictures.

Thank you for purchasing the RB5 Mid Custom Special conversion, I hope you will enjoy the build and the car as much as I do.

Fabien Simonini – FAST Racing

KIT PARTS



The kit contains all the parts shown in the picture above:

- ✓ 1 x 6082 hard anodised aluminium, numbered main chassis
- ✓ 2 x 6082 anodised aluminium chassis sides, one left one right
- ✓ 2 x 6082 anodised aluminium Front Posts
- ✓ 2 x 6082 anodised aluminium Rear T-Plate holders
- ✓ 2 x 6082 anodised aluminium Top Links Holders
- ✓ 1 x 6082 anodised aluminium Motor Mount
- ✓ 1 x Stainless Steel T-Plate
- ✓ 2 x Vacuum Molded Gearbox halves, one left one right
- ✓ 1 x 4mm Thick Carbon Fibre Shock Mount
- ✓ 1 x 3mm Thick Carbon Fibre Gearbox Brace
- ✓ 1 x 2mm Thick Carbon Fibre Battery Strap
- ✓ 2 x 0.5mm Thick Carbon Fibre RF suspension mount spacer
- ✓ 1 x 2mm Thick Carbon Fibre RR suspension mount spacer
- ✓ 10 M3 x 6mm countersunk screws
- ✓ 8 M3 x 10mm countersunk screws
- ✓ 1 x UM125 genuine Kyosho Idler gear shaft
- ✓ 1 x UMW513 genuine Kyosho SP idler gear

As you can see, each chassis has been numbered from 0001 to 0030. At the time this manual is being written, only 30 kits have been produced, but more may be made depending on the success of the kit.



STEP 1

First you need to prepare the chassis in order to be able to add the front and rear ends to it. Using the M3 x 10mm screws provided with the kit, bolt each side on the chassis as shown. You can use more screws (not provided) in order to increase the torsional rigidity of the chassis, this has been found useful on extremely high grip conditions. For normal conditions we recommend the kit setting. Note that the very forward screw is tightened into the Front Post, which slides into the sides in order to hold it. Do not hesitate to tighten the screws quite a lot, and the use of threadlock is recommended on every screw that goes into aluminium.

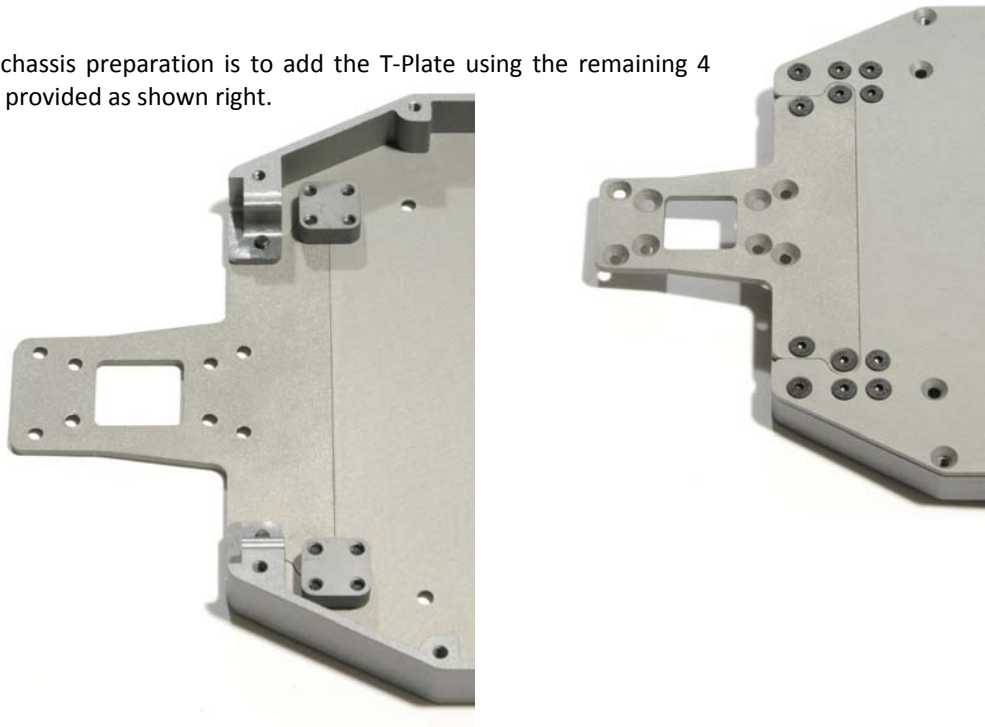


You should be ending with the chassis looking like the picture on the right. Note the way the milled parts on the rear end of the chassis sides are put.



Next is to add the T-Plate holders, using 6 of the provided M3 x 6mm countersunk screws, as shown left.

The last stage of chassis preparation is to add the T-Plate using the remaining 4 M3 x 6mm screws provided as shown right.



The Chassis is now ready to accept the front end



STEP 2 – FRONT END

The next step is to remove the front end from your RB5 (if you are converting an already existing car) and to bolt it on to the MCS chassis



The front end is literally a direct fit on the MCS chassis, all you have to do is remove it and bolt it on using the same screws that you removed. Not shown here, the servo is also a direct fit and should not even require a re-trim on the track.

STEP 3 – REAR SUSPENSION

The suspension blocks need some adaptation in order to fit the car properly. The reason is that there are moldings and parts on the original car that could not be reproduced. On the RF/RF2 block the 0.5mm spacer is there to replace the raised section of the plastic T-Plate, and on the RR/RR2 block, the 2mm spacer is there to replace the rear bumper that isn't used anymore.

So the RF/RF2 block will need the two protrusions around the screws removed either with a knife or a small file. It's a good idea to use the gearbox to see how much material needs removing.

The RR/RR2 block needs most of the horizontal extrusion filed away or removed with a knife.

This is because the car was designed with the aluminium blocks in mind, which do not have these protrusions. It was only later found out that the plastic parts were different. It is therefore recommended to use the aluminium parts on the car.

In addition, the RR/RR2 block needs to have the gap where the T-Plates fits cut straight. As the original follows the curve of the plastic T-Plate, and the MCS T-Plate extends further back. If you are using the aluminium block, you will need to file this away, but on the plastic parts a knife will be sufficient.

The Carbon parts should fit nicely in the blocks. With one of each fitted, the suspension geometry is identical to that of the RB5 with no spacers.

The Anti-squat is then set at 3 degrees, as is the rear toe-in.

The car's design allows for up to 1mm of spacers to be added under the RF/RF2 block. The standard Astro-Turf setup uses the block at its highest position in order to raise the Roll Centre.

Adding 0.5mm of spacers under the RR/RR2 block will decrease the anti-squat by 0.75 degrees. An Anti-Squat chart is available online on the Petit RC website.



Our blocks are now ready to be mounted on to the T-Plate. Screw the RF/RF2 with the spacer as shown. You can easily insert the spacer using the following procedure:



- ✓ Start Screwing one of the screws into the mount, totally ignoring the spacer, but do only screw by a couple of turns
- ✓ Slide the spacer under the block
- ✓ Insert the second screw in the T-Plate, you should end up with what's shown on the picture to the right
- ✓ Backing off the second screw, screw it into the RF/RF2 block, and now you can tighten both screws fully.

Once the RF/RF2 block is in place, it's time to insert the rear suspension and the RR/RR2 block, not forgetting the 2mm carbon fibre spacer.



We have now the rear suspension fully attached to the car, it's time for the drivetrain.



STEP 4 - DRIVETRAIN

The gearbox is truly the centrepiece of this car as it also has a function as a chassis strengthener and the rear shock tower is mounted directly on to it. It's now time to have a look at it.

But first a word of warning:

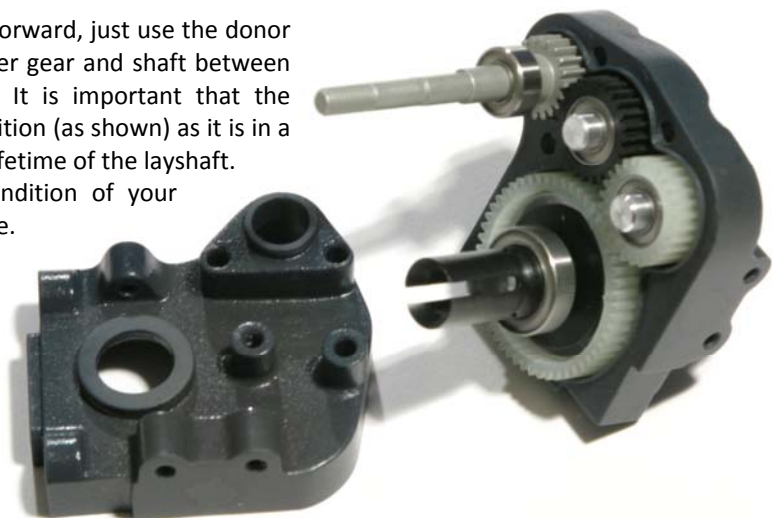
The gearbox is made using the *vacuum molding* manufacturing process. This process is very well adapted to low production volumes. It has its limitations however and in our case, the limitations are shown in the materials that can be used. It has been found that the material we use does not stand heat as well as the material that was used in the prototype car. The gearbox is therefore likely to fail if it gets too hot by either:

- ✓ **inadequate gearing**
- ✓ **running the car for too long (to be on the safe side of things, it is reasonable to say no more than 7 minutes at a time)**
- ✓ **Running the car with the slipper set too loose (for example the slipper set for the slippery section of the track, and therefore slipping too much on the grippy section of the track, this will get the slipper very hot)**
- ✓ **Whether you are using the Phat Bodies Zen shell or X6 shell, make sure to open up some holes in order to get some airflow on the motor**
- ✓ **Some gearboxes have been known not to run freely once the motor plate has been tightened. In this case the bosses where the idler gear shafts go are a little too tall and bind on the idler gears. The friction could create heat in this very sensitive zone. If your gearbox shows this symptom, then a simple solution is to use sand paper on the bosses until the gearbox spins freely even when the motor mount has been tightened up (a tip on how to do this will follow). Bottom line is the gearbox should spin as free as on the original RB5**

If you follow all these precautionary measures, the gearbox should last you for a long time. We are always working on ways to improve this and hopefully will get totally rid of the heat issue.

Assembling the gearbox is fairly straightforward, just use the donor car's internals, and add the provided idler gear and shaft between the layshaft and the white idler gear. It is important that the provided black idler gear goes in this position (as shown) as it is in a different material that will increase the lifetime of the layshaft. It's also a good idea to check the condition of your layshaft and maybe replace it at this stage.

Note that you will not be able to use the plastic C-Clip on the left diff outdrive as it would now rub on the gearbox's casing. You will still have access to the hole to change the diff setting however.



Once all the internals have been put into place, it's time to close the gearbox and put the motor mount. Using 3 out of the donor car's 4 long screws, as well as an M3 x 10 countersunk screw. It is at this stage that you should make sure that the gearbox spins freely even when the motor mount screws are tight. If they are not open the gearbox and take the idler gears bosses down a little. We're talking 2/10th of a millimetre here, not a big amount, but it is enough to create heat.



With the gearbox now fully tightened, add the slipper as it is supposed to be assembled on the RB5. Then add the rear Carbon Fibre brace. Make sure the countersunk holes are facing what will be the back of the car, as shown in the picture to the left (as we cannot see the countersinking from this view).

The gearbox is now ready to be slotted into position on the car:



The gearbox should slot in nicely between the two suspension mounts, but the square section that slots inside the T-Plate can be a bit of a tight fit, so do not hesitate to push fairly hard. The gearbox is then secured on to the chassis by four M3 x 8mm countersunk screws, and the carbon fibre brace by two M3 x 10mm countersunk screws on to the chassis sides as shown.

STEP 5 – REAR SHOCK TOWER AND END OF ASSEMBLY

The rear shock tower and the top links holders must be prepared next. For this you will need the four M3 x 12mm screws used on the donor car to secure the shock tower mount on to the chassis.

Screw the ball studs on the top links holders on the position that you have chosen for your setup, then screw the top links holders on the shock tower.

Add the screws for the shocks and the wing mounts as shown.

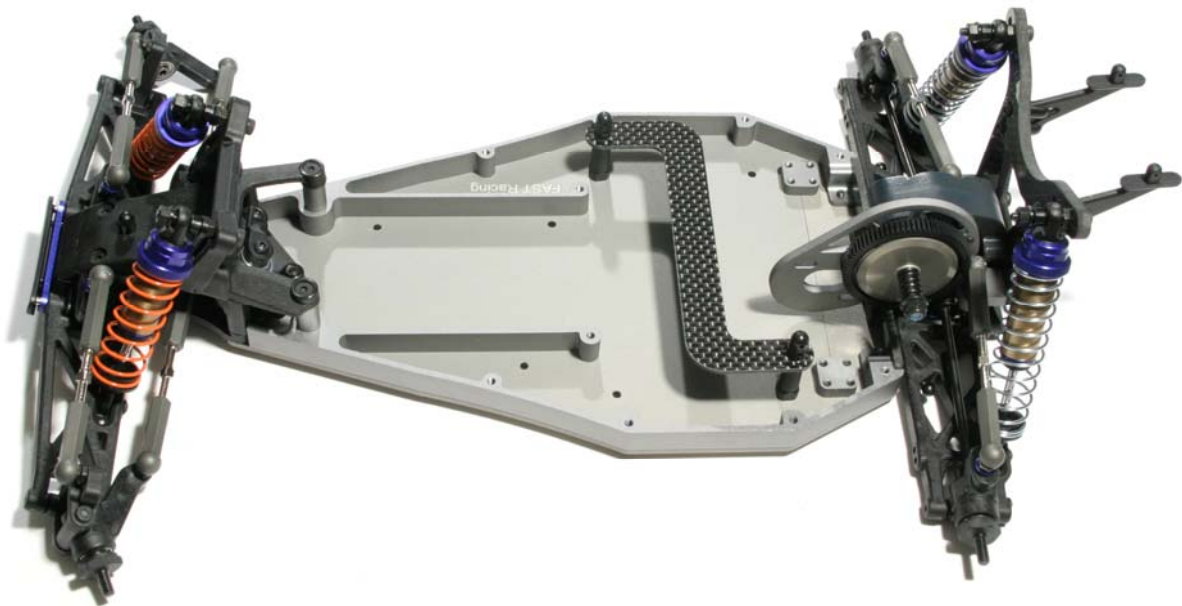
Using the screws used on the donor car to secure the shock tower, mount the shock tower on the gearbox. For more strength, it is recommended to use longer screws but there are none available from the donor car other than those. Some M3 x 12mm would be highly recommended.



At this stage the last two things to add are the shocks and the battery posts.

The shocks are mounted on the shock tower with the plastic ball reversed so as to move the shock body closer to the shock tower. The turnbuckle does come close when the car's wheelbase is at its longest but should be fine.

The last thing to add are the battery strap posts. In the RB5 kit are two lengths posts provided, you should use the longest ones and position them as shown. The battery strap is then secured as on the RB5 with circlips.



Your Mid Custom Special is now ready to receive the electronics, some nice wheels and a freshly painted bodyshell. We recommend the Phat Bodies Zen shell and a separate sheet on how to cut it and fit it on the car should follow soon.