

Rotary Racer 9 Plan

Introduction

This is taken from all of the ideas and general car designs that have been generated to date.

Objectives

1. To design and build a car more efficient than RR8 and go more miles than RR8.
2. To match the new 2013 rules (Drivers bum and battery bottom less than 100mm above the track).
3. To try and win races and the national final.
4. To have as much younger team member involvement in the build at all stages.
5. Try and keep RR8 intact at least until RR9 is ready to run. Maybe RR8 can be modified for F24+ in 2013 ?

Design Needs

1. Generally the same as RR8, build on top of that design.
2. Safe (Good roll-bar, Drivers safety cage, side impact bars, roll resistant etc).
3. Needs to be more aerodynamic than RR8. GB's new design looks to have a 25% improvement in aerodynamics to RR8. Main features of this: Thinner body (top to bottom), less curvature on the floor, roll-bar thinner behind head, fully enclosed rear wheels, generally more optimised shape.
4. Lighter as much as possible.
5. Should fit up to about 1.850m tall drivers (adults)..

Design Ideas

1. Generally the same as RR8, differences below.
2. Use same basic chassis design as RR8, 25.4mm aluminium tube with plastic bung joints. Same basic shape but with narrowed in front and rear. Use less more strategically placed cross members. Should have a drivers "safety cage".
3. Simplify rear sub-frame/rollbar design to reduce weight and be strong. This could integrate the roll-bar, chassis cross-beams and rear axle into one assembly.
4. Lighter motor mounting with same ease of adjustment. Probably needs to be mounted to sub-frame/rollbar design.
5. Batteries fitted in from top just behind driver and rollbar.
6. Same basic steering arrangement, with lighter components made.
7. Floor made with good quality 3mm ply with CarbonFibre/Kevlar strengthening under driver. Could go with full CarbonFibre/kevlar floor if we get extra money.
8. Bonnet made from 3mm or 2mm ply. Could use a carbon fibre/fibreglass shaped bonnet with integrated windscreen.
9. Use foam for sides, perhaps hollowed out for weight. Could make some CF/GF sides in the future.
10. Fully enclosed rear wheels. Shaped cf/gf moulding or other to fit over the wheel opening and fair in the top of the wheel.
11. Move to using lighter, more efficient 8mm or other chain.
12. Use 16inch wheels (need to make some or use those from RR8)

13. Tail could be detachable for ease of transport.

Misc Ideas

1. Rotating front wheel fairing ??
2. Batteries use automatic connection scheme, no plugs and sockets.
3. Automatic battery opening flaps :)

Materials

Material	For	Have
Alu tube: 25.4 x 1.6 mm	Main chassis	Yes
Steel tube 25.4 x 1.6 or 2 mm	Rollbar, Rear subframe, front steering bits. Should we use cold drawn steel tube for this ?	
Plywood 3mm	Floor and top surfaces	
Plywood 8mm	For front bulkhead	
CarbonFibre/GlassFibre	For floor strengthening, bonnet and body parts	
Epoxy resin	For floor strengthening, bonnet and body parts	
Bungs	Main chassis bungs	Yes
Bug bolts		
Steel bar	For front steering bits	
Aluminium bar, 25.4mm	For rear axle	May have ?
Joystick parts	Steering	May have ?
Ball joints	Steering	
Wheels	Need rims and spokes have hubs	
Wheel bolts (23mm ?)	Hardened steel bolts	
Nuts,Bolts and Screws	General	
Aluminium sheet	General	Yes
Cloth and webbing	Seat	
Harness	Seat	
Foam	For nose cone and beside driver	
Gears and chain	Drive	
Wheel gear mount	Aluminium turned	
Throttle, wiring, electronics	Control	