

GRDO6 design concept and chassis construction detail

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With my interest in FI and Le Mans sports cars I always had the dream that I may have one or the other in my garage, that I could take to a classic club race meeting. With the cost of a wife and family my chances were pretty slim that I would ever realize that dream.

In the past I have been in Kart racing with some success with my own chassis design. I have built 5 chassis to suit different engine sizes with good results club championships etc. The first visit to Kart race meeting I enquired on the cost of karts in race trim that I could have some hope of being competitive in at the club level. The answer I got was you have to spend X amount of dollars on a factory built chassis to be competitive. Looking at the design of the then current Kart chassis I decided to build my own chassis. Obtained the best of materials, 4130 steel for chassis and imported components I could not manufacture and made jigs to hold chassis for welding etc. The end result was a chassis which was adjustable in caster and camber, and chassis flex different to that any of the local Kart racers had seen. Construction standard was up to the factory karts. My first season in Kart racing ended in coming third in club championship for KTIOO class. After that I had a number of requests for my chassis and in the end five were made. From that time I decided to do my own designs and not accept the norm that you have to spend x dollars on the factory gear to do any good at racing.

I decided to design my own sports car with the end result a Le Mans type sports car that I hope will look good and be competitive in club racing. After the design and construction of the monocoque we moved house and our new home did not have a workshop that would suit my needs. A further 6 months went by before I had my workshop constructed and set out so I had construction area and a separate chassis assembly area.

I obtained a copy of the FIA SR2 sports prototype regulations and have worked from that for most areas. The chassis is a full monocoque; this type of chassis has torsional stiffness, which is considerably better than the bathtub type of monocoque that has been used in the past. The chassis is of sandwich construction, two skins

of aluminum separated by a core material. It is possible to obtain flat sandwich panels already made. They are expensive, used in marine and aerospace sectors they are difficult to cut and shape.



Workshop Layout

The method I have used is to fold my inner and outer skins of aluminum to the shape of my chassis design. Enclose 4 bulkheads to take loading from suspension and motor mounts roll cage etc, with a flat assembly surface marked out and supports for bulkheads. The inside skin of aluminum was riveted and bonded to extruded 25mm channel, which had been bonded and riveted to bulkheads. The core material was then cut and shaped to fit between skins. The next stage was the bonding of the core material to the inner and outer skins with the outer riveted on. This may be hard to follow see my drawing.



Front bulkhead

The rear of the car has a Toyota 4AG 20-valve engine, lightweight flywheel, racing clutch, fabricated bellhousing. The gearbox I have decided to use is a VW type 1 transaxle with 3rd and 4th gear ratio change. I looked at a number of different types but the main problem was the length behind

the diff of the gear clusters. One of my design objectives was to keep weight within wheelbase, so the VW was the best in this area; the only problem would be its ability to take the torque of the Toyota engine. The off road racing in USA use this type of box and have a number of heavy duty parts and ratios available to suit, so the cost is considerably less than a Hewland gearbox



Gear change and dash bulkhead

Suspension will be double wishbones with anti-intrusion bars on front with pushrod front and rear operating bellcranks to damper/spring assemblies. The shock absorber body's are my own design and will have Penske valve assemblies. The uprights will be fabricated in steel. I looked for a production based type but was not able to find suitable type to suit my suspension geometry. I have ordered the steel for suspension and made a start on the construction of the front uprights, using 4130 for aims and 1040 for uprights.



Interior bulkheads and pedal assemblies

That is my progress to this time, slow I know, but I tend to build a item and if not look right start again until happy with end result

Right: Engine with sump fitted



Fabricated bellhousing and rear bulkhead



Damper bodies



Construction method note the use of angle extrusion between sheet face

