



## Auto Futura Newsletter:

### CAV GT Undergoes a Torsional Stiffness Test

Chassis stiffness and rigidity is an interesting topic. A structure that looks stiff is not necessarily stiff in the areas it needs to be. Chassis stiffness is critical in race cars. If the suspension design is to function optimally, the platform it is attached to needs to be as rigid as possible. If the chassis is flexing, the fine tuning of the suspension becomes a pointless exercise.

There are guidelines laid down for minimum torsional stiffness as far as vehicle safety is concerned and this value is 6 500 Nm / degree. A standard production road car will typically have a torsional stiffness value of between 6500 Nm / degree and 7 500 Nm / degree.

When we decided to revise the CAV GT chassis (almost three years ago), one of our primary objectives was to improve the torsional stiffness to compliment the re-designed suspension geometry. We wanted to produce a real drivers car, something that the original designers of the Ford GT 40 would have been proud to belt around a race track.

Our monocoque chassis is made up of 67 stainless steel panels. There were several objectives when we did the chassis re-design and they included improved torsional stiffness, greater strength, dimensional & geometric accuracy, superior interior head room and a simplified manufacturing technique. In the end, 66 of the 67 panels were altered and our new generation chassis was born.



We were confident that our revised chassis would make a big difference to the car. The additional head and leg room we achieved was very well received and the chassis felt very taut on the road. We did however want to quantify the torsional stiffness so we approached a Dr Terry Terblanch of Biomer systems to help us design a test rig and then to do an independent static torsional stiffness test.

A PDF copy of the report showing the methods, graph and report is available for download from our website, for those interested in the technical aspects.

<http://www.cav.co.za/newsletter.htm>

The results of the test exceeded our expectations. The CAV GT monocoque chassis, without a bolt in roll cage, has a torsional stiffness value of 32 000 Nm / degree of twist. To put this into perspective, the production Corvette Z06's have a TS value of 9 000 to 10 000 lb-ft/deg (12 200 to 13 600 Nm/deg). The racing Corvette C6-Rs used at Le Mans, which has full racing roll cage, has a TS of 28,000 lb-ft/deg (38 000 Nm/deg). Formula 1 tubs typically have anything from 10 000 Nm/deg to 40 000 Nm/deg.

Viewing the CAV GT results against these figures proves we have a chassis worthy of a supercar!

### **CAV GT's New Pedal Box**

One of the very first things we did when we started building the CAV GT was to redesign the pedal box. While we were very happy with our initial race style pedal box it was difficult and time consuming to manufacture and assemble. When the stock levels started getting low, we decided a design review was in order.



The new design had to be more pleasing for the driver to use, easier to manufacture and assemble and of course it had to look good too. This time, we decided to opt for aluminium instead of fabricated steel parts. The aluminium pedals were profile cut using high pressure waterjet machines. All other aluminium parts were CNC machined before going for anodising. By using different materials and changing the design, we were able to achieve better pedal spacing and improved overall feel. The pedals now run on deep groove ball bearings instead of bushes. It is still fully adjustable and has a race car look. The new pedal box is compatible with all CAV GT's so it is possible to upgrade to

this pedal box. Best of all is that we have increased the quality of our pedal box, while drastically reducing the assembly time.

### **CAV GTR - (Race Car)**

The first dedicated race car has left the factory and is being sprayed. The engine and gearbox package is being assembled and we hope to have it on the track within the next two months. The race car features a lightweight body, fully rose jointed suspension, race spec Wilwood brakes, roll cage, race seats, lightweight stripped out interior, polyresist rear decklid, 16" BRM semi slicks / slicks, FIA approved rubber fuel cells, fully removable front and rear clips, race car air vents and high horsepower drive shafts.



The race car will also get our new bolt on splitter to help with front downforce at high speed and we are currently working on a rear diffuser as well.

Our standard road car has been very well received by local race drivers. There has been much praise for its handling and feel. We are really looking forward to the completion of the CAV GTR and being able to offer such to our customers. Those interested are welcome to contact us ([john@cavgt.co.za](mailto:john@cavgt.co.za)).

The CAV GTR will be on display at Le Mans 2007.