

2nd Edition-2007



UniSA Motorsport turns heads at Collingrove

During July two of the teams members took the 2006 car out for some friendly competition at the Sporting Car Clubs Winter Cup 3 Hill climb event in Collingrove. After a full day of racing against other high powered street and circuit cars Lachlan Smith and Tim Schenk ran a 44 second and 45 second run respectively, in the Open wheeled under 1300cc class.

Although we weren't the fastest up the hill we definitely caused a bit of a stir and had a lot of interest from competitors and spectators interested in the uniquely designed car. Testing different wheel offsets produced some interesting result which will be used to help us in further competitions.



Thanks to the Sporting Car Club of SA for an enjoyable day of friendly competition, and a well organised and safe event, with credit to the many volunteers that ran the day so well. We hope to be back again next year with the 2007 car to really set the pace.

Progress Report

With the designs for the 2007 car finalised for the manufacturing stage the car's final form has taken shape.

Engine:

As mentioned previously, this years car has veered away from the previous 4 cylinder 600cc Honda engine as seen in the 2006 car. A move to a Polaris 500cc single cylinder engine has been implemented for 2007. The Honda engine, although a powerful motor, was designed for high revving and consequently minimal torque exists at the lower rev range. This is not the optimum power band for the particular requirements of the track and of the car. The single cylinder engine will prove to have more torque at lower revs and will provide a more usable power band for faster exits out of corners and less engine lag at low speeds.

Gearbox:

Last years gearbox was a standard six speed mated to the Honda engine. Although functional and reliable, it proved too much for the track as the drivers were unable to use the upper gears even when the sprockets were geared down. This years Polaris engine features a five speed gearbox and with correct sprocket sizes we will be able to utilise all gears, resulting in a very responsive car at low speeds while still being able to reach top speeds without excess gearing.

Chassis:

The designs for the space frame steel chassis are complete and ready for production. Design and analysis for the aluminium, steel and carbon fibre three piece chassis are still under consideration. The steel frame will be used for extensive testing of the complete car while allowing for valuable component validation and driver training in preparation for the final event.



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Progress Report....continued

Suspension:

For this years vehicle the front suspension will be push rod inboard mounted shock absorbers. This will reduce the unsprung weight in the front suspension and enable us to produce a more responsive and adaptive system with lighter springs.

The rear suspension is also changing to an inboard mounted shock absorber but will be a pull rod actuated system due to packaging in the rear of the chassis and also to place the link in tension to enable a lighter design.

The added bonus of designing the suspension more compact visually and within the chassis envelope will also gain us valuable design points in the static judging event.



Driveline:

This year the most important change to the driveline system is the addition of a limited slip differential which is a custom made design for the Formula SAE event. It is a very compact design weighing in at only around 3kg. This will be one of the most important additions to the drivability of the vehicle when compared to the 2006 vehicle. In complying with the teams decision to produce a lighter vehicle the driveline will have the normal ball joints removed from the driveline and we will be opting for fibreglass flex plates to save considerable weight over the traditional methods.

Driver Control Systems:

The driver position has been set with seat, pedal and steering system designs finalised and ready for installation into the vehicle. The driver position for the 2007 car is a much more upright with lifted knee height. This was done to enable the team to produce an overall shorter vehicle keeping to the requirement set for a shorter wheel base. It also allows the nose of the vehicle to be brought back closer to the front wheels to reduce the front overhang and polar moment of inertia during cornering.

The pedal box has been reduced in size by eliminating adjustment, instead the driver's seating position will be adjustable. Also there are only two pedals on the 2007 vehicle due to the electronic clutch which enables the width of the front of the vehicle to be reduced also.

The seat as mentioned previously will be adjustable via interchangeable inserts with a base seat being moulded to the driver contours and produced from fibreglass with a Carbon-Kevlar outer layer for visual effects.

Vehicle Control Systems:

The Mechatronics team has been hard at work finalising their systems to be implemented on the vehicle. The gear-shifting system has taking form and awaiting testing on the 2006 chassis to complete the fine tuning of the system. This system should give the team an added advantage in the acceleration event with perfect gear shifting.

This system will give the drivers a real advantage in not having to remove their control from the steering wheel and also be having a repeatable and smooth gear change enabling the driver to concentrate on road ahead.

The Launch Control System is also nearing completion and testing should begin shortly after the gear shifting has been verified. This system should add a further advantage to the acceleration event with near perfect launching every time.



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