MONASH MOTORSPORT

F O R M U L A S A E 2 0 0 3

Newsletter - October Edition

Inside this issue:

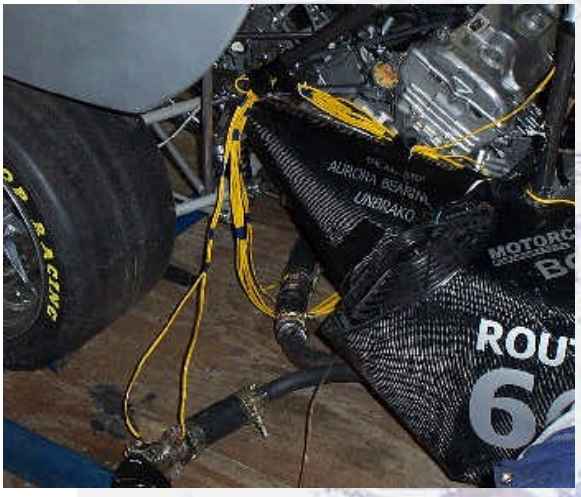
As we step into October, and see the competition looming just two months away, it is with a combination of joy and relief, that we can announce that the Monash PLM Formula SAE racer has roared into life for the first time. Weighing in at a lithe 200kgs with half a tank of fuel, race ready, but with no wings, the car will begin its first test runs this week at Motorcycle Motion in Moorabbin. These initial shakedowns will establish just how much we have managed to improve on the solid baseline established by the 2002 car. A comprehensive testing program will then follow with details of areas under investigation discussed later in this issue. The aim is to be totally prepared for all eventualities come the race in early December.

Having used the last month to solve various electronic, driveline and steering issues, the team also took the opportunity to undertake some extensive wind tunnel and engine dyno development work. The details of these sessions can be found later in this issue. The results of both are extremely pleasing.

As promised the team also appeared at the Sandown 500 and the SAE Aerodynamics Conference. The Sandown 500 especially saw the car generate a tremendous amount of interest from the general public, much more so than the Melbourne and Swinburne cars that were also on display.

With the car launch scheduled for Thursday the 9th (this week) the team look forward to presenting our labour of love to all those who have supported us over the past year. If you haven't received an invitation yet, be sure to get in touch with us, all are welcome to what should be an enjoyable evening for all.

Wind Tunnel Testing



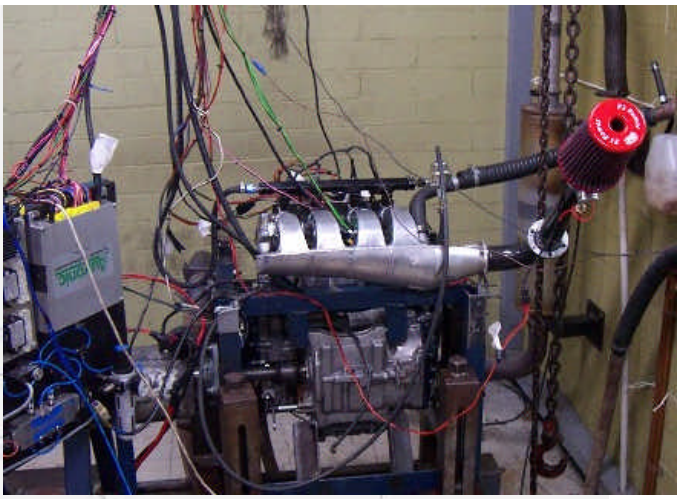
Once again taking advantage of the largest wind tunnel in the Southern Hemisphere, the 2003 testing program was expanded to make use of the custom radiator testing rig recently installed into the Monash tunnel. Using the Specific Dissipation rig the team were able to perform extensive tests of the new single radiator cooling system. With Tailem Bend expected to generate temperatures in excess of 35°, the cooling system is going to need to operate under the harshest of environments. With this in mind a range of set-ups were tested, including variable flow rates, radiator ducting, wind speeds and Davies Craig fan operating points. The end result is a cooling system with the capability to cool the engine sufficiently under any conditions the event can throw at us.

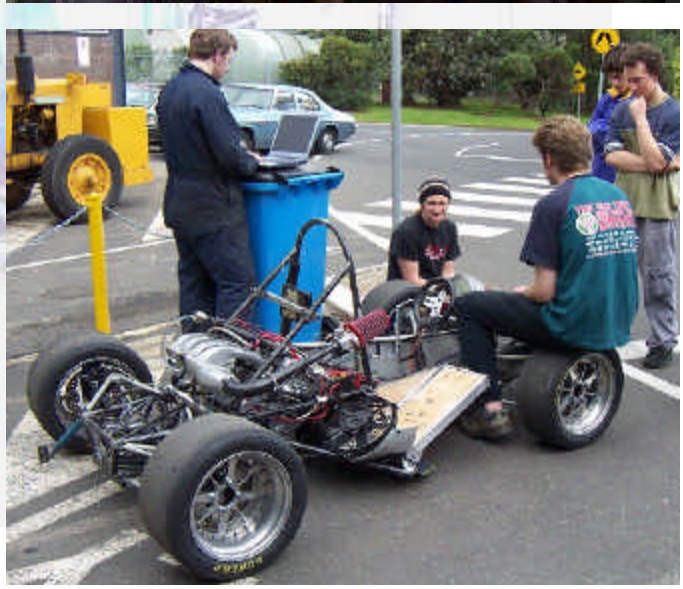
Also tested extensively was the new 2003 Aero package. Testing work focussed on developing the optimum wing set-up for the road speed expected at the competition (~40-60kph average). With this in mind the wings were tested with variable slot gaps, end plate geometry, angle of attack settings, and element numbers. As a result of these solid three days of testing, the team now has a comprehensive aero map to work from when making decisions about the optimum wing settings for the race. Thus the advantage the team has in aerodynamics can be fully exploited on track

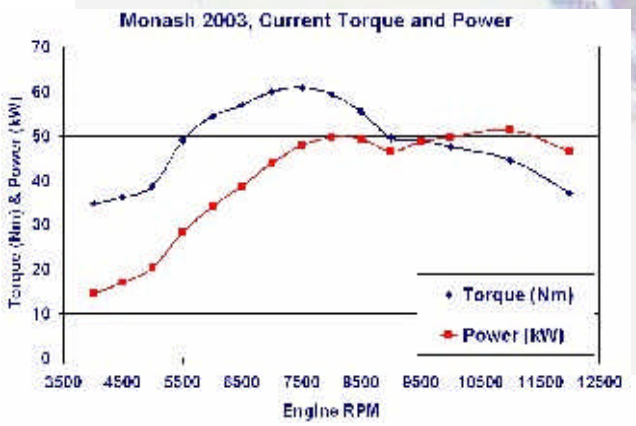
Dyno Tuning

Having overcome various dyno-related issues, the team finally had the opportunity to fully test the new 2003 student fabricated engine exhaust and intake package. With the specific aim of improving on the mid range torque levels, provided by the 2002 configuration, the team were pleased to find some impressive torque numbers being generated. With the critical range from 5,500-9,500 rpm showing torque values greater than 50Nm, the team are confident of having a very responsive and driveable engine at the event. The large mid range torque numbers were obtained through the use of a specially tuned 4-2-1 exhaust system. Manufactured from 0.9mm stainless steel the exhaust exhibits the fascinating tendency to glow red-hot as can be seen on the right. While not a concern, onlookers were taken aback at this rather extreme sight.

Having manufactured the exhaust based on the lengths tuned in April, the new intake was left with the capacity to tune variable lengths to suit the exhaust. By altering the length of the intake runners between the range of 330-450mm in 20mm increments the team was able to locate the sweet spot of interaction between the intake and exhaust. The final result of this tuning can be seen on the graph below. Track tuning will now focus on on-off and part throttle tuning.







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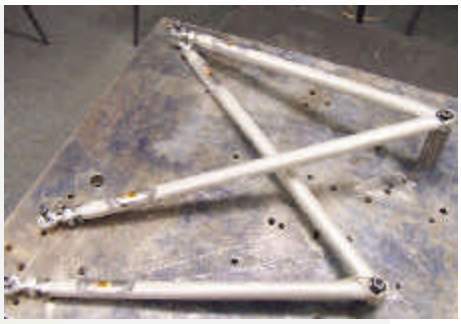
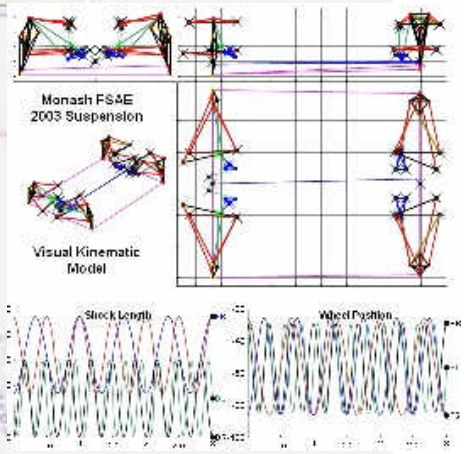
Future Development Aims

With the car now operational the team has identified a number of areas of development over the next two months. These include:

- Strain Gauging of wishbone members to accurately determine cornering loads in the suspension.
- Strain Gauging of wing mounts to quantify on track the amount of downforce being achieved.
- Development of a clutch pack limited slip diff based on a Honda ATV unit almost identical in size to the current unit, aimed at improving corner exit traction and turn in performance.
- Traction Control and its refinement. The Honeywell wheel speed sensors already exist on the car therefore allowing refinement to be performed through the Autronic ECU
- Analysis of data from the range of sensors outlined previously within our student developed suspension visualisation program. This allows quick diagnosis of suspension related issues.
- Manufacture of second iteration lighter bell cranks, possibly of different motion ratio, to alter some suspension dynamics. Will be determined by testing results.
- Manufacture of lighter wing endplates, saving 3 kg.





Sandown Summary

Under typically glorious Melbourne weather, featuring blue skies and sun, interlaced with the odd hail stone, gushing flood and cyclonic wind, the 2003 racer appeared at the Sandown 500 V8 supercar round. Fresh off the production line, the car looked superb in its naked carbon finish, fitting right in with the stylish show cars on display in the same area. Not!! As a highly developed and tuned race car the public were fascinated with the car and the general concept behind it. The usual large crowds huddled around, which no doubt would have swelled even further had the dummy engine been capable of starting.

The interest in the car was consistent despite the weather, with special interest being shown by the Telstra girls; who gleefully posed for a photograph. Well not really, we had to beg and plead, but for sure it was worth it. On that note, the car clearly outshines them in the looks department though!!

(I don't think so either, but hey I am supposed to be promoting the car here, aren't I?!)

Sponsor Feature – Austuf Coatings

Austuf Coatings operate in a niche market specialising in the manufacture of architectural mouldings and decorative features using polystyrene foam. Finding extensive use in the home building industry, the use of wire cut polystyrene foam, surface finished in a special urethane coating, the complex shapes that can be produced are significantly lighter and cheaper to produce than their cement based equivalents. With a Wintech CNC hot wire cutter on site, Austuf are capable of cutting virtually any complex 2D shape in a matter of minutes. They can then apply the urethane hard coat to any specification/thickness required by the customer.

As a fantastic supporter of the team, Austuf have CNC wire cut our wing profiles for the past two years, while also assisting with the cutting and coating of our body moulds. A special thanks goes to Chris Brown for his tremendous assistance over the past two years.

Unigraphics Progress Model