With just under two weeks remaining in the fall semester, Christmas vacation hangs heavy on our minds, the month-long vacation promises to be extremely productive, not to mention relaxing.

The team completed our 4130 space-frame, and it looks great despite a few small asymmetries. On the front of the car, one of the bellcrank mounts lies slightly further from the centerline than the other, but because of the equal bellcrank angles, changing one of the pushrod lengths (which adjust anyway) will solve the problem. The rear box, displaced an inch to the right of the centerline, presents a bigger problem; since the suspension pick-up points weld to this box, left uncorrected the rear wheels would be off center—obviously unacceptable. This surprised us because we jigged the box well, but members tweaked during welding. We reconsidered our techniques and decided to weld out more of the joints before removing the jigs, rather than quickly tacking members together and removing the jigs for welding access.

Our removable engine mounts, pictured here, also tweaked out of specification when we welded them. The above solution worked, and we see no reason why it would not with the rear box also. We rebuilt the removable engine bar, this time welding out as much as possible with the engine bolted in. Since our team builds the car in parallel rather than in series, newer people will correct the frame while the more experienced machine components necessary to get the car sprung; we will not lose much time.
Thanks to Pate Freight, a shipping company based out of Houston Texas, we received a shipment of over 100,000 dollars worth of engine dynamometer equipment. Adrian Juergens and Bill Ritter at Shell donated this new equipment that will serve as a replacement for our old water-brake dyno that was used in previous years. The use of a water-brake dyno to tune a high performance engine posed problems such as the inability to hold RPM’s at an accurate level. With the use of the new dynamometer and its controls we expect our engine to perform more efficiently, yielding an increase in power, a better torque curve, and better gas mileage.

The power source that is available in our dyno room is 120 volt three-phase, but we need 230 volt single-phase to run the new eddy-current dynos. With the approval from Don Artieschoufsky, the head of the Mechanical Engineering department’s machine shop, we submitted a request to hire an electrician to install a step-up transformer in effort to provide the correct voltage. Once we get the required power to the dyno, we can begin engine tuning - an event we are all looking forward to.

Thanks to all of you, we’ve had enough money to begin ordering various components of the car that we don’t fabricate ourselves. Recently, we ordered our wheels, pictured here. The Jongbloed’s magnesium JRW 304 wheels, rolling on Hoosier 20 x 6-13 R25A racing slicks, should arrive by November 28th. We decided on the Jongbloeds because the aluminum Kodiak wheels (that we used last year) flexed under high acceleration. In addition to this, the Jongbloeds look great.

We’ve received our Pegasus order, which includes header-wrap, a 6-point safety harness, and a quick-disconnect for the steering wheel. With the use of header-wrap we can minimize the loss of heat in the headers and maintain a high flow rate in the exhaust. Last year’s car used a 5-point safety harness which was criticized by design judges at competition. They are allowed by the rules, but the judges deducted points anyway, leading us to be extremely conservative with safety issues on the 2004 car. Quick disconnects are required by rule so the driver can disconnect the steering wheel (in a snug drivers compartment) and quickly exit the vehicle.
in case of an emergency. Last year’s quick disconnect used a hex pattern, while this year’s has splines, as seen in the photograph. This, along with the removal of the two universal joints from the steering column (made possible by this year’s improved positioning of the steering rack), should remove all the slack present in Hubs’ steering system. Plus, our new disconnect has an integrated 8-pin electrical connector through which we can cleanly install warning lights and shifter buttons onto the steering wheel - exciting stuff!

We've also received our engine headers from S&S and our exhaust from Dennis Kirk. The headers arrive in 6 separate pieces, which means we must tack it together to fit it between the exhaust and the engine. These will bolted on once the intake manifold has been fabricated. After this work is done, we will begin tuning the engine. As we continually order and receive new items for the racecar, expect to be updated on our progress in future newsletters.

Here are some design issues we've completed or are considering:

We completed the suspension design, focusing on limiting roll center migration and track-width variation, and trying to keep the camber curves equal for the front and rear wheels. Once the suspension jigs are done, we'll be able to weld the suspension tabs on while simultaneously building our a-arms, pushrods, camber adjusters, caster adjusters, uprights, and bellcranks. Camber and caster adjusters will let us fine tune the vehicle's performance, and in cooperation with adjustable front and rear anti-roll bars will allow us to adjust nearly every handling characteristic. By evaluating data from the driver and possibly a data acquisition system, we can tune the vehicle to its optimum performance; the judges will be impressed with the versatility of our vehicle.

Paul Shepherd has been working on the electrical wiring for our car. After gaining experience wiring Hubs, he decided adequate planning and preparation results in an accessible, weather proof and aesthetically pleasing electrical system. He ran labeled strings on the frame to get the lengths of all the wires and to ensure he didn’t miss any. He cut the wiring to length and after crosschecking his work a few times. Paul will run the wire groups through heat shrink and attach all the connectors. The extra preparation will pay off with an attractive, reliable wiring harness.
The team is considering in-car video, not only to liven up our PowerPoint presentations and website with a driver's perspective, but also to record what the car is doing and compare it to data acquisition data. We will open a new section on the website with these movies once we have set up the cameras and related components (memory storage, vibration control, etc.).

Benjamin Reeves is pursuing more sponsors, including the University Co-op, Coca-Cola, Motorola, BNC Software, American Airlines, HEB, Bluco, Caterpillar, KXAN Television, UPS, Verizon Wireless, and Peterbilt. The sponsor’s page will be updated with all the current logos and contacts; please let us know if you’d like anything changed.

That’s all for now! Once again, thanks so much for your support, and we look forward to hearing from you with comments and suggestions!

*Longhorn Motorsports*

Thanks again!